Detailed Implementation Plan
Entiat Water Resource Inventory Area (WRIA) 46

Prepared for the
Entiat Watershed Planning Unit

By the Chelan County Conservation District

Through Washington Department of Ecology
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ACRONYMS

Acronym	Definition
AU	Assessment Unit
BA	Biologic Assessment
BLM	US Bureau of Land Management
BO	Biologic Opinion
BEF	Bonneville Environmental Administration
BPA	Bonneville Power Administration
CCCD	Chelan County Conservation District
Cfs	cubic feet per second
CRMP	Coordinated Resource Management Plan/Planning
CWA	Federal Clean Water Act
DIP	Detailed Implementation Plan under RCW 90.82
District	Chelan County Conservation District
Ecology	Washington Department of Ecology
EDT	Ecosystem Diagnosis and Treatment
EQIP	Environmental Quality Incentive Program
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
EWPU	Entiat WRIA Planning Unit
FCRPS	Federal Columbia River Power System
HCP	Habitat Conservation Plan
HPA	Hydraulic Project Approval
HUC 6	USGS Hydrologic Unit Code - Sixth-field/level
LSC	Landowners Steering Committee
LWD	Large Woody Debris
NOAA	National Oceanographic and Atmospheric Administration
NEPA	National Environmental Policy Act
NPCC	Northwest Power and Conservation Council
NRCS	Natural Resource Conservation Service
PUD	Public Utility District
SEPA	State Environmental Policy Act
SMU	Stream Management Unit
RCW	Revised Code of Washington (State Law)
RM	River Mile
RTT	Regional Technical Team of UCSRB
UCSRB	Upper Columbia Salmon Recovery Board
USBR	United States Bureau of Reclamation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code (State Rule)
WDFW	Washington Department of Fish and Wildlife
WDOE	Washington Department of Ecology
WDNR	Washington Department of Natural Resources
WPA	Watershed Planning Act (RCW 90.82, a.k.a. 2514)
WRIA	Water Resource Inventory Area
WRIA 46 Plan	Entiat Water Resource Inventory Area (WRIA) 46 Management Plan

1.0 INTRODUCTION

In 1993, members of the Entiat community and agency representatives initiated natural resource planning for the Entiat subbasin under the Natural Resources Conservation Service (NRCS) Coordinated Resource Management Planning (CRMP) framework. In 1998, the CRMP group reorganized to form the Entiat Water Resource Inventory Area (WRIA) 46 Planning Unit (EWPU) in accordance with the Watershed Planning Act (WPA) - Chapter 90.82, Revised Code of Washington (RCW).

Between 1998 and 2004, the EWPU utilized WPA funding provided through the Washington Department of Ecology to successfully complete the first three phases of watershed planning: Phase 1 - Organization, Phase 2 - Assessment, and Phase 3 - Plan Development. Existing data from multiple sources, new assessment information, and input from local residents, stakeholders, and resource agency representatives formed the basis for the Entiat WRIA 46 Management Plan (CCCD 2004). The Entiat plan addressed the required water quantity element, and also included instream flow, water quality and habitat actions and strategies to maintain or improve watershed conditions related to these elements. The WRIA 46 plan was unanimously approved by the EWPU on May 17, 2004 and by the Chelan County Commissioners on September 13, 2004. It was the third watershed plan in the state created under the WPA to be approved, and the first of its kind to contain instream flow recommendations.

In February 2005, the EWPU received its first installment of Phase 4 - Implementation funding under the WPA. Because watershed plans created under Chapter 90.82 RCW are required to address water quantity, associated Detailed Implementation Plans (DIP) must contain strategies, timelines, and interim milestones to measure progress towards providing sufficient water for:

- Production agriculture;
- Commercial, industrial, and residential use; and
- Instream flows [RCW 90.82.043 (2)].

The WPA also states that the water quantity related timelines and interim milestones in a detailed implementation plan must address the planned future use of existing water rights for municipal water supply purposes that are inchoate, including how these rights will be used to meet the projected future needs identified in the watershed plan. Planning Units must assure communication with municipal water right holders regarding how the use of these rights will be addressed when implementing instream flow strategies identified in the watershed plan [RCW 90.82.048].

A detailed implementation plan must clearly define additional coordination and oversight responsibilities. It must identify what interlocal agreements, rules, or ordinances are necessary for implementation; any needed state or local administrative approvals; permits that must be secured to implement actions; and specific funding mechanisms [RCW 90.82.043 (3)]. In developing its DIP, a planning unit must consult with other entities planning in the watershed management area and identify and seek to eliminate any activities or policies that are duplicative or inconsistent [RCW 90.82.043 (4)].

This document is the Detailed Implementation Plan for the Entiat Water Resource Inventory Area (WRIA) 46. ***In order to facilitate review, a RCW reference code is included after the title of sections that pertain to legislatively required DIP elements.***

In addition to required water resource management actions, this plan identifies habitat and water quality actions for implementation; includes strategies and timelines for achieving multiple resource goals; outlines how success will be measured; recommends monitoring strategies, and provides reasonable assurances regarding implementation.

The actions outlined within this DIP are based on recommendations contained in the Entiat WRIA 46 Management Plan (CCCD 2004) and subsequent documents that were based on the core content and actions recommended in the WRIA 46 plan, e.g. the Entiat subbasin plan (NPCC 2004) and draft Upper Columbia Salmon Recovery Plan (UCSRB 2005). This implementation document has been developed through input from members of the Entiat WRIA Planning Unit and other interested stakeholders.

2.0 PURPOSE

The purpose of this plan is to outline a framework for maintaining or improving the health of the Entiat and Mad River watersheds through implementation of Entiat WRIA 46 Management Plan recommendations. Actions and strategies identified in the Entiat management plan will help:

- correct altered conditions and improve or maintain overall watershed health;
- attain compliance with the Clean Water and Endangered Species Acts, and
- contribute to the recovery of listed species and opportunities for recreational and tribal fisheries, in accordance with the vision and goals of the EWPU

All recommended WRIA 46 Plan actions and the goals the actions designed to achieve them are included in Appendix A. Refer to Appendix B for actions recommended specifically for USFS managed lands.

3.0 SETTING

The Entiat River flows through a scenic rural valley in north central Washington, Chelan County, and joins the Columbia River at river mile (RM) 483.7 (Figure 1). The headwaters originate in the glaciers and forested landscape of the Cascade Mountains. The Entiat River watershed is almost entirely in US Forest Service ownership from RM 26 upstream to the headwaters. The middle portion of the Entiat watershed is sparsely populated with some agricultural use, while the lower portion of the watershed below the Mad River confluence (RM 10.1) and town of Ardenvoir is typified by rural residences and agricultural (orchard) production. The Mad River watershed is predominantly in US Forest Service ownership from RM 4 upstream to its headwaters. The Entiat WRIA lies within territory ceded by the Yakama Nation in 1855.

Climate in the Entiat WRIA is highly variable year-to-year and even within a single year, with 90 and 100-degree temperatures that last for several weeks at a time in the summer, and sub-zero temperatures during many winters. Rapid snowmelt results in high volumes of run-off in late spring and early summer, and low stream flows in late summer, early fall, and throughout the winter. Vegetation community types range from near-desert shrub steppe at lower elevations to sub-alpine at higher elevations. The watershed provides habitat for endangered spring Chinook, and threatened summer steelhead and bull trout. It also supports many resident fish species and a variety of wildlife including bear, deer, beaver, and waterfowl.

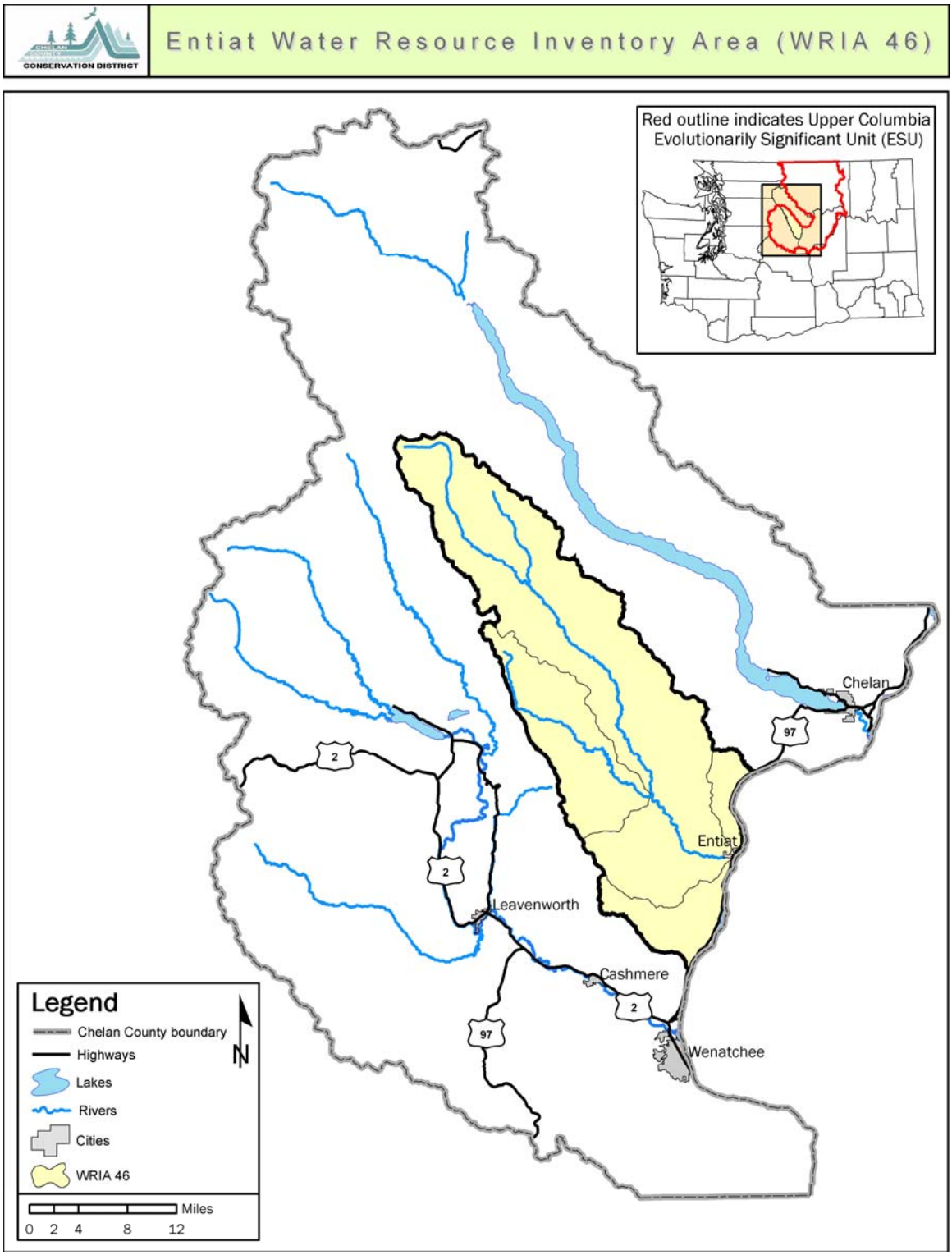

Figure 1. Location of WRIA 46 within Chelan County, the Upper Columbia Evolutionarily Significant Unit (ESU), and Washington State.

Ownership within WRIA 46 is predominantly public. The US Forest Service (USFS) manages approximately 83% of lands within the WRIA. Other federal land owners include the Bureau Of Land Management (BLM) and the US Fish and Wildlife Service (USFWS). Almost all state lands (5.7%) are managed by either the Washington Department of Fish and Wildlife (WDFW) or the Washington Department of Natural Resources (WDNR). Only about 8.8% of the WRIA is in private ownership. At the time of the 2000 Census, data indicated that population in the valley (excluding the City of Entiat Urban Growth Area) was approximately 839. Most of the privately owned lands are found in the valley bottom and along streams.

Past land use practices such as grazing, logging and associated road construction, and early flood prevention and agricultural practices that were initiated before the turn of the 20th century and continued through the 1970's have contributed to some of the current resource problems and habitat degradation within the watershed. River straightening and damming resulting from historic logging activities, and channelization/diking associated with early-to-mid century flood control practices have simplified aquatic habitat conditions dramatically, particularly in the lower portion of the mainstem Entiat River. Wildfires, fire suppression and reductions in timber harvest - and resultant forest fuels increases, grazing, and other land use activities have also altered vegetation community structure in some areas.

Many Entiat families and orchardists are descended from original homesteaders and have lived in the valley for generations. Farms range in size from hobby farms of a few acres, to orchards of over a hundred acres. The economic base of the watershed is founded on agricultural (orchard) production, primarily pears and apples with some cherries. Other land uses within the watershed include hay and livestock production, grazing, timber harvest, residential housing, and recreation.

Residents of the Entiat valley are interested in maintaining or improving the health of the watershed, sustaining agricultural production, enhancing community viability, restoring fish populations and fishing opportunities, and minimizing potential impacts of future growth and development. This document provides strategies and actions to attain these goals.

Some resource issues in the Entiat subbasin are beyond the control of its citizens. Soils within the Entiat valley are generally highly erodible due to deposits of volcanic ash and pumice or loess at the surface. Significant portions of bedload and suspended sediments are normally deposited in the lower watershed where many agricultural, residential and commercial properties are located. Natural events such as wildfire and floods occur frequently within the watershed. Over 60% of the Entiat watershed has been affected by wildfires that occurred between 1970 and 1994. The flood of record occurred in 1948, and significant flooding also occurred in 1972, twice in 1977, and in 1989 following wildfires.

4.0 APPROACH

4.1 Overview

This implementation plan is meant to be a reasonable approach to achieving watershed protection and enhancement in a realistic timeframe under the known physical, political, social and economic limitations. It is based on the Entiat Watershed Planning Unit's belief that using the best available science and local data, working collaboratively to address problems, and encouraging voluntary actions is the best way to achieve shared objectives that include compliance with state and federal environmental standards, recovery of ESA

listed species, and sustainable watershed health in balance with community values, growth and vitality.

Specifically, the EWPU's goals are:

1. Optimize quantity and quality of water to achieve a balance between natural resources and human use both current and projected.
2. Provide for coexistence of people, fish and wildlife while sustaining lifestyles through planned community growth, and maintaining and/or improving habitats.
3. No avoidable human-caused mortality of state and federal threatened, endangered and candidate species.
4. Develop and implement an adaptive action plan to address priority issues, emphasizing local customs, culture and economic stability in balance with natural resources. All actions will comply with existing laws and regulations. However, changes to existing laws and regulations will be recommended as needed to attain our common vision and avoid one-size-fits-all solutions.
5. Recognizing the significance of the roles of limiting factors outside of the watershed and natural events within the watershed, the long-term goal is to have the Entiat River's existing and future habitats contribute to the recovery of listed species and to eventually provide harvestable and sustainable populations of fishes and other aquatic resources.

In addition to specific project actions, this Implementation Plan includes information on potential implementation funding sources, and highlights mechanisms for interagency cooperation. It also identifies programmatic changes designed to help sustain or improve watershed health, track implementation, and enhance community involvement and health. Lastly, it includes outreach strategies designed to:

- Share information with Entiat watershed residents about resource issues and best management practices;
- Notify landowners of technical assistance and cost-share incentive programs that are available to them;
- Review implementation progress and look ahead to new initiatives;
- Share and discuss data and monitoring results, and examine progress toward achieving resource and restoration objectives; and
- Create an ongoing forum for addressing new issues, such as salmon recovery goals, and enable community based adaptive management.

While voluntary participation and compliance forms the core of the Entiat effort, this plan acknowledges that existing legal frameworks dictate how some actions must be conducted and regulated, and identifies legal processes and documents necessary for implementation. In certain cases formal rules may be necessary to provide legal assurances and safeguard the Entiat valley's resources for generations to come. For example, the new Entiat Water Resources Management Program, Chapter 173-546 Washington Administrative Code (WAC), details how water resources and instream flows will be managed within WRIA 46 through the year 2025.

This document outlines an incremental approach to implementing the Entiat WRIA Management Plan, developed and managed by the Entiat WRIA Planning Unit. It identifies timelines and milestones against which to track progress, and identifies monitoring and adaptive management techniques that will be used to evaluate and alter watershed

management strategies if necessary. Reasonable certainty that the actions will be taken is also provided when possible.

The WRIA 46 Plan identified that the EWPU (or its successor) and other interested members of the public should continue to meet regularly to oversee the implementation process and enable adaptive management.

4.2 General Sequencing Strategy

The WRIA 46 Plan identified numerous actions that should be taken to improve overall watershed health (Appendix A), but did not always provide a detailed description of where different project types should be implemented within the WRIA.

The EWPU identified that some actions like applying best management practices or improving water efficiency are best implemented throughout the Entiat subbasin, as appropriate, using an opportunistic approach. Although these projects will sustain or improve overall watershed health, it is not necessary to target their implementation at specific geographic areas in order to address critical habitat limiting factors or priority resource issues.

Conversely, the EWPU recognized that a more detailed framework is necessary to guide implementation of habitat restoration actions and other projects designed to achieve salmon recovery goals or regulatory compliance. A more critical, strategic approach should be used when implementing these types of projects to ensure that:

1. Implementation efforts are coordinated;
2. Projects focus on limiting factors, priority needs and geographic areas; and
3. Actions make the most efficient use of available resources.

The implementation strategy in this document denotes priority geographic location(s) for restoration, when appropriate, and the types of activities recommended/appropriate for implementation within each area of the subbasin. The strategic framework in this document should serve as the primary "roadmap" for all agencies and partner organizations interested in implementing elements of the WRIA 46 Plan, particularly habitat restoration activities, as well as actions identified in the Entiat subbasin and draft regional salmon recovery plan.

4.2.1 Geographic Considerations

The Entiat River Water Resource Inventory Area (WRIA) 46 boundary was established through rule under WAC 173-500, and serves as the overarching geographic boundary for the area addressed by the Entiat Management Plan and .this implementation document. WRIA 46 encompasses the Entiat and Mad River watersheds, as well as some minor tributaries to the Columbia River. Past efforts have sub-divided the WRIA further into assessment units, management units, sub-watersheds, or other areas for the purpose of organizing research, project development, implementation and management work.

The WRIA 46 Management Plan primarily divided the drainage into four areas:

1. **Lower Entiat** - From the confluence with the Columbia River (RM 0.0) to the Potato Moraine (RM 16.2). This distinction was made based on the change in geomorphology at the Potato terminal glacial moraine, at associated change in fish habitat/utilization upstream from this point.

2. **Upper Entiat** - From the Potato Moraine (RM 16.2) to Entiat Falls (RM 33.8). This division was utilized due to the change in fish distribution that occurs at Entiat Falls, a natural barrier to the upstream migration of anadromous fish. Within the upper Entiat, the USFS management boundary at RM 26 serves as a point of change for management discussions.
3. **Above Entiat Falls (RM 33.8) to the headwaters.**
4. **The Mad River watershed.**

Subbasin plans, developed under the Northwest Power and Conservation Council's (NPCC) planning process to mitigate for impacts to aquatic systems caused by operation of the Federal Columbia River Power System (FCRPS), used the term Assessment Units (AU) to describe distinct geographic planning areas. The Entiat Subbasin Plan utilized the same delineations as did the WRIA 46 Plan, resulting in four Assessment Units:

1. **Lower Entiat AU** (RM 0.0 to RM 16.2, the Potato Moraine)
2. **Middle Entiat AU** (RM 16.2 to RM 33.8, Entiat Falls)
3. **Upper Entiat AU** (RM 33.8 to headwaters)
4. **Mad River AU** (RM 0.0 to headwaters)

The Water Resources Rule, Entiat River Basin (WAC 173-546; Appendix C) established "stream management units" in WRIA 46 for the purpose of managing water resources and instream flows. The stream management units were based on existing WRIA 46 plan delineations and the location of the USGS stream gages at which the instream flows are monitored. The stream management units were defined as follows:

1. **Lower Entiat** - From the confluence of the Entiat and Columbia rivers to the terminal glacial moraine at RM 16.2, including all tributaries except the Mad River;
2. **Upper Entiat** - From the terminal glacial moraine at RM 16.2, to the Entiat River headwaters, including all tributaries; and
3. **Mad River** - From the confluence of the Mad River with the Entiat River to the Mad River headwaters.

Smaller, more discrete stream reaches/geographic areas have also been defined for the Entiat and Mad Rivers, based on a higher degree of understanding of watershed attributes and processes. The Entiat River Inventory and Analysis (CCCD 1998) and Ecosystem Diagnosis and Treatment (EDT) analysis (Mobrand Biometrics, Inc. 2002) further segmented the Entiat and Mad River drainages using aquatic habitat conditions and watershed considerations such as disturbance history (e.g. fire, flood), sediment zones (source or transport), and land use. The USFS, for forest planning purposes, also stratified the subbasin to a finer degree than the WRIA 46 or Entiat subbasin plan.

4.2.2 Geographic Prioritization of Actions

The geographic prioritization framework used in this document considers existing reach, subwatershed, assessment unit, and watershed boundaries along with professional knowledge of current resource conditions and areas in the WRIA that have been most impacted by past activities. The level of geographic specificity necessary for strategic project implementation of WRIA 46 plan recommendations varies depending upon the type of action proposed and variability of natural resource issues within the Entiat subbasin.

Water resource and instream flow management activities that relate to implementation and tracking of Chapter 173-546 WAC (Appendix C) will utilize the stream management units described previously and established in rule (lower Entiat, upper Entiat, Mad River). Proposed water management related actions, such as irrigation system conveyance improvements and on-farm application efficiency upgrades, will occur primarily within the Lower Entiat and Middle Entiat Assessment Units (AUs) due to the fact that almost all of the consumptive water use within the Entiat subbasin occurs in these areas. The Assessment Unit level is commonly used in this document to direct project actions to the most appropriate areas within the subbasin; however, some efforts such as maintaining water quality or performing outreach and education are best carried out at the subbasin-wide scale. As such, not all actions identified in the WRIA 46 plan have an Assessment Unit level of specificity defined to guide implementation

Reach/subwatershed (intra-Assessment Unit) areas were delineated by members of the EWPU habitat subcommittee and UCSRB Regional Technical Team to guide implementation of active habitat restoration project actions, particularly those related to improving aquatic/instream habitat conditions (Figure 2). These more specific intra-AU areas were defined based on knowledge of past habitat alteration and potential for improvement/restoration of habitat quantity, quality, and associated salmonid production. The EWPU felt that this finer level of detail was necessary to direct instream restoration activities at priority reaches and limiting factors for salmonid production.

Technical subcommittee/EWPU members assigned the intra-AU areas a rank order of implementation priority. For example, within the lower Entiat AU (RM 0.0 - 16.2), the area below the Mad River confluence (RM 10.2) was assigned Rank 1 because "…it has been most influenced by past activities and should be the priority area for active restoration projects" (CCCD 2004). In addition to a rank order, intra-AU areas were assigned to a high, medium, or low priority tier. Habitat restoration and salmon recovery actions should occur concurrently within all high priority areas of the subbasin. A tiered approach is necessary so that implementation efforts are not limited to one area at a time. The information contained in Table 1 describes the Entiat intra-AU implementation areas, the assigned priority (rank order and tier) for habitat restoration actions, and the rationale for level of priority.

Table 1. Intra-Assessment Unit implementation areas and associated habitat restoration priorities (rank and tier).

Assessment Unit	Intra-AU Implementation Area and Description	Subwatersheds (HUC 6) Contained By Intra-AU Area	Mainstem EDT Reaches Contained By Intra-AU Area	Rank	Tier	Rationale for Rank and Tier
Not Applicable	Minor Columbia River tributaries; intermittent stream and gulches draining directly to the mainstem Columbia R.	Part of Spencer-Swakane-Tenas (HUC 6 1702001015D); Ribbon Mesa (HUC 6 1702001015C).	Not Applicable	0	N/A	WRIA 46 Plan, WAC 173--546, Entiat subbasin plan did not recommend actions for minor Columbia River tributary areas.
Lower Entiat	Mouth to the Mad River confluence (RM 0.0 - RM 10.2)	Lower Entiat (HUC 6 1702001003A); Mills-Dinkleman (HUC 6 1702001003M); Roaring (HUC 6 1702001003L)	E1: RM 0.0 - RM 0.6 E2: RM 0.6 - RM 3.2 E3: RM 3.2 - RM 6.2 E4: RM 6.2 - RM 8.8 E5: RM 8.8 - RM 10.2	1	High	Historic flood control projects and channelization were focused in this area of lower river. Greatest potential for overall habitat quantity and quality improvement.
	Mad River confluence to Potato terminal moraine (RM 10.2 - 16.2)	Part of Lower-Mid Entiat (HUC 6 1702001003B); Potato portion of Stormy-Potato (HUC 6 1702001003G)	E6: RM 10.2 - RM 11.8 E7: RM 11.8 - RM 14.0 E8: RM 14.0 - RM 15.2 E9: RM 15.2 - RM 16.2	3	High	Mainstem altered to a lesser degree by past activities than in area below Mad River confluence.
Middle Entiat	Potato terminal moraine to USFS boundary (RM 16.2 - RM 26.0)	Part of Lower-Mid Entiat (HUC 6 1702001003B); Mud (HUC 6 1702001003F), Stormy portion of Stormy-Potato (HUC 6 1702001003G); Brennegan-Preston (HUC 6 1702001003H).	E10: RM 16.2 - RM 18.3 E11: RM 18.3 - RM 23.1 E12 from RM 23.1 - 26.0	2	High	EDT model predicted LWD/habitat quality restoration projects will provide higher level of benefit to endangered spring Chinook life history stages than area above Mad River confluence.
	USFS boundary to Entiat Falls (RM 26.0 to 33.8)	Part of Lower-Mid Entiat (HUC 6 1702001003B); Upper-Mid Entiat (HUC 6 1702001003C); Lake-Silver-Poe (HUC 6 1702001003I) Tommy portion of Three-Tommy (HUC 6 1702001003K)	E12 from RM 26.0 - 27.8 E13: RM 27.8 - RM 29.3 E14: RM 29.3 - RM 31.0 E15: RM 31.0 - RM 33.8	4	Medium	Less room for improvement of habitat quantity and diversity than in lower portion of Middle AU or in Lower AU. USFS management starts at RM 26; upper bound marks natural barrier to anadromous fish distribution.

Table 1. Intra-Assessment Unit implementation areas and associated habitat restoration priorities (rank and tier) (continued).

Assessment Unit	Intra-AU Implementation Area and Description	Subwatersheds (HUC 6) Contained By Intra-AU Area	Mainstem EDT Reaches Contained By Intra-AU Area	Rank	Tier	Rationale for Rank and Tier
Upper Entiat	Entiat Falls (RM 33.8) to USFS Wilderness boundary.	Three portion of Three-Tommy (HUC 6 1702001003K); Upper Entiat (HUC 6 1702001003D); North Fork Entiat (HUC 6 1702001003J)	N/A	7	Low	No anadromous fish use above Entiat Falls, no active restoration needed. Area is under USFS management and in good condition overall.
	USFS Wilderness boundary to Entiat River headwaters	Headwaters Entiat (HUC 6 1702001003E)	N/A	8	Low	No anadromous fish use. High degree of USFS protection - wilderness area. In properly functioning condition.
Mad River	Mouth to Pine Flat Campground (RM 0.0 to RM 4.2)	Lower Mad (HUC 6 1702001008A)	M1: RM 0.0 - RM 2.0 M2: RM 2.0 - RM 4.2	5	Medium	Extent of restoration needed is minor in comparison to Entiat areas; limited treatment options. Remaining portion of the Mad River watershed is in good condition.
	Pine Flat Campground (RM 4.2) to Mad River headwaters	Middle Mad (HUC 6 1702001008B); Upper Mad (HUC 6 1702001008B); Headwaters Mad (HUC 6 1702001008C)	M3: RM 4.2 - RM 10.0 (Camp 9) Remainder N/A	6	Low	No active restoration needed. Area is under USFS management and essentially in properly functioning condition.

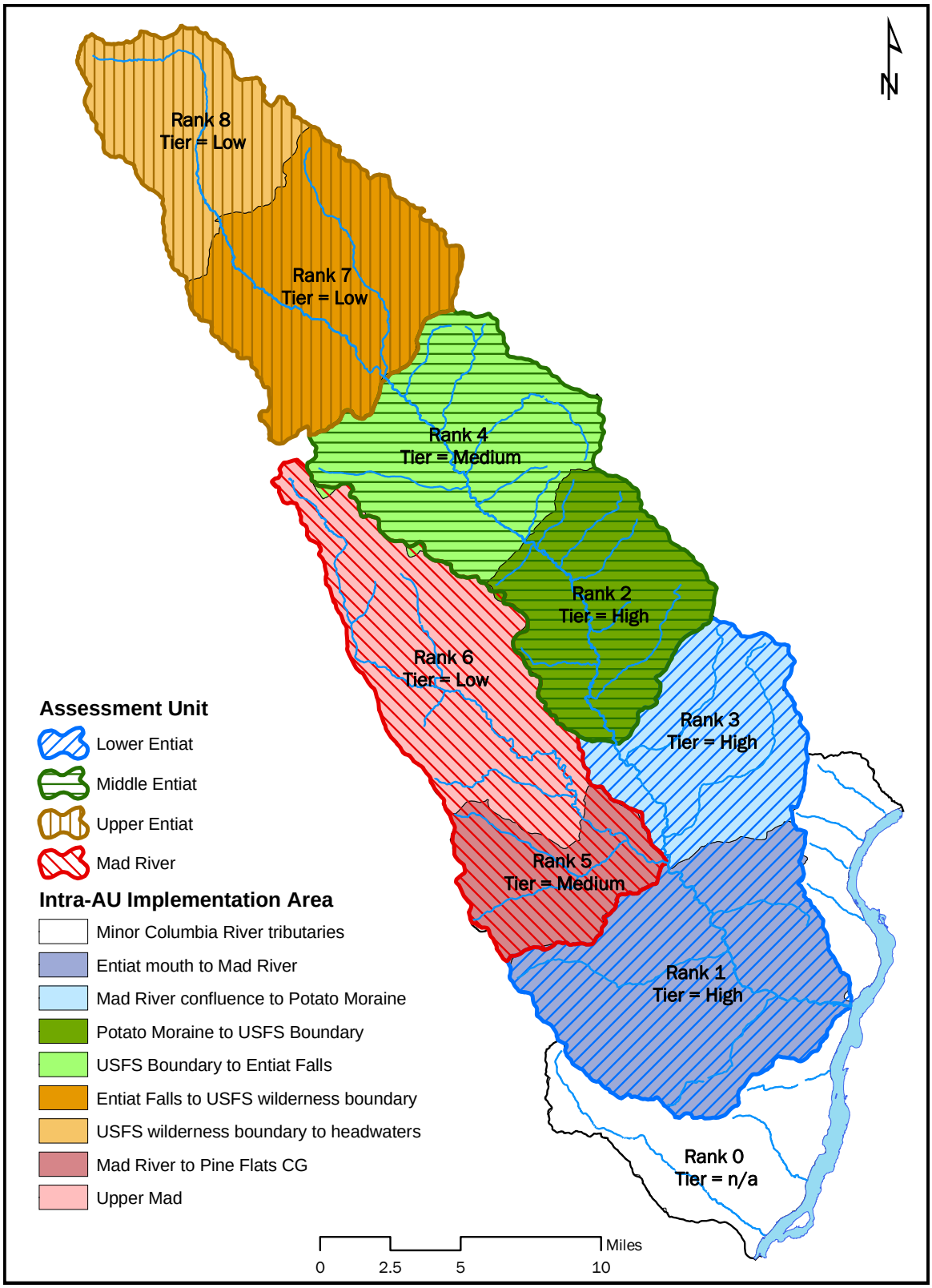

Figure 2. Entiat River Water Resource Inventory Area (WRIA) 46, Assessment Units, Intra-AU implementation areas and associated priority (rank/tier) for habitat restoration actions.

4.2.3 Biologic Prioritization of Actions

Actions recommended in the WRIA 46 Plan were developed based on biologic data and knowledge of primary limiting factors, as well as community concerns. Chapter 9 of the Entiat plan states that:

> *1) Development of the plan actions occurred via a local effort to address both community and ecological issues.* Recommendations were designed to help meet resident's goals that include retaining the quality of life and rural feel of the Entiat valley, supporting agricultural production, avoiding further reduction of the tax base, and promoting community unity and moderate growth in the years to come; and
>
> 2) Implementation has been locally driven and collaborative. The participation of many landowners, agencies, tribes and other stakeholders has enabled the development of strategic partnerships and coordinated action. Projects must … be implemented in an informed and coordinated manner….

It is very important to note that the EWPU project identification process relied as much on the use of best available science as it did input and guidance from the community about the types of restoration actions they thought would best meet the goals of valley landowners. As a result, the specific actions recommended by the EWPU to provide biologic benefit in the Entiat subbasin have general "built-in" public support for implementation.

With respect to specific types of restoration actions, the EWPU recognizes the importance of restoring or sustaining natural processes and watershed function, where/when feasible, vs. utilizing an active management approach. Although passive restoration (e.g. allowing a stream to meander) should be utilized when possible to help restore habitat, this type of technique is not always possible given demographic, land use and property ownership patterns within a watershed.

The EWPU determined that the primary means to address limiting factors in the lower Entiat Assessment Unit is implementation of active instream restoration actions that restore habitat complexity and diversity such as large pools and off-channel areas. Both rock and wood instream structures are appropriate within this area of the subbasin. The reconnection of side- and off-channel habitats is also a priority; however, there are a limited number of sites within the lower AU where this type of activity may be possible given the lower river's history of channelization, the presence of dikes, and acknowledgement that the existing pattern of agricultural and residential development precludes floodplain and off-channel reconnection in many areas. Therefore, most aquatic habitat restoration activities in the lower AU will likely rely on the use of instream structures to restore habitat diversity and complexity.

The main habitat objectives for the middle Entiat AU are the use of passive restoration, installation of large woody debris complexes to enhance habitat and pool formation, and preservation of properly functioning habitats. No large hardened (rock) instream treatments are recommended in this area of the watershed due to its very good overall condition; the low-gradient, meandering characteristics of the Entiat River upstream of the Potato moraine; and the highly erodible nature of the soils. Some rock placement as part of engineered LWD complexes may occur. In some reaches of the middle AU, past grazing and land use activities have resulted in extreme bank instability and exacerbated rates of erosion and sediment delivery. Instream restoration activities that utilize wood complexes to provide additional habitat diversity as well as bank stability will need to be designed and sited using a reach-based surveying approach to assure that wood structures that are installed do not

adversely affect downstream landowners or alter system hydraulics; these projects will also require a riparian revegetation component.

No active instream habitat restoration actions have been identified for the upper Entiat AU, as it is essentially in properly functioning condition. All lands within this portion of the subbasin are under USFS management. Biologic priorities within this AU include preservation of and improvement to general watershed condition through roads, upland and recreation-related management projects. The USFS has identified a number of strategies to address resource issues in the upper Entiat and Mad AUs and other areas of the subbasin under its management. Refer to Appendix B for USFS restoration strategies.

Within the Mad River Assessment Unit, the lower four miles of the drainage (Lower Mad AU - to Pine Flat Camp Ground) comprise the area of interest for active instream habitat restoration. Rock structures that increase habitat diversity through gravel retention have been identified as appropriate in this area. Activities recommended for the Upper Mad AU - above Pine Flat) are similar to those proposed in the upper Entiat AU. Actions proposed for USFS managed portions of the AU may be found in Appendix B.

Implementing riparian revegetation projects is a subbasin-wide habitat priority. This restoration action class will enhance macroinvertebrate production, increase site-specific shade and help moderate stream temperatures, restore riparian habitat and LWD recruitment processes, and contribute to improvement in overall watershed health.

5.0 WRIA 46 STRATEGIES AND ACTIONS

This section is the heart of the detailed implementation plan for the Entiat subbasin. It contains the strategies required by the WPA to address water quantity and instream flow issues, and provides a framework for implementation strategies and actions to meet these and the habitat and water quality restoration objectives identified in the WRIA 46 plan. All strategies and actions recommended by the EWPU may be found in Appendix A.

5.1 Required Strategies [RCW 90.82.043 (2)]

The Entiat WRIA 46 Management Plan is unique in the State of Washington. At the time of authorship of this document, it is the only WRIA plan developed and approved under the WPA that contains required strategies to provide sufficient water for:

(a) Production agriculture

(b) Commercial, industrial, and residential use; and

(c) instream flows, as well as timelines to achieve these strategies and interim milestones against which to measure progress.

On September 3, 2005 WAC 173-546, "WATER RESOURCES MANAGEMENT PROGRAM--ENTIAT RIVER BASIN, WATER RESOURCE INVENTORY AREA (WRIA) 46" took effect, implementing the WRIA 46 plan strategies that were developed to address all three categories of water use. The full text of Chapter 176-543 may be found in Appendix C. Through adoption and implementation of this rule, sufficient water should exist for future instream and out of stream use categories through the year 2025, the planning horizon established during rule development. Thus, provided that parties continue to implement and track the rule, the EWPU and this implementation plan are already in compliance with RCW 90.82.043. The implementation plan for Chapter 173-546 may be found in Appendix D.

Details regarding the amounts of water and implementation actions associated with each category of water use follow.

5.1.1 Water for Production Agriculture

The EWPU determined that maintaining the existing commercial agricultural economic base and providing opportunities for limited future expansion of commercial agriculture activities in the valley is essential for preservation of the community, its culture, and economic vitality. Strategies to provide adequate water for production agriculture through the year 20025 were identified during the negotiated rule making process used to develop the Entiat River Basin rule.

Adoption of the rule authorized allocation up to 3 cubic feet per second (cfs) of new out-of-stream water for commercial agriculture ventures and associated water rights. While implementation of this section of WAC 173-546 alone is sufficient to address this required element of the WPA, the WRIA 46 Plan identified additional strategies and actions to assure that commercial agriculture would not be limited by water supply in the watershed. Please see the additional action and strategies section of this DIP for more information.

5.1.2 Water for Commercial, Industrial, and Residential Use

The EWPU determined that in order to enable future community and economic growth, water for future commercial (i.e. business), industrial, and residential uses was necessary. The WRIA 46 Plan and rule provided up to 1 cfs for potable and related residential water use and up to 1cfs for commercial and light industrial uses in the valley. While implementation of this section of WAC 173-546 alone is sufficient to address this required element of the WPA, additional strategies and actions were identified in the WRIA 46 Plan to assure that commercial, industrial, and residential uses would not be limited by water supply in the watershed. Please see additional action and strategies section of this DIP for more information.

5.1.3 Water for Instream Flows

The EWPU determined that maintaining and when possible enhancing the existing instream flows in the Entiat River watershed necessitated the establishment of instream flow levels in rule (Administrative instream flows). Administrative instream flows were established to protect aquatic resources in the Entiat and Mad River watersheds, and are monitored at three control points: USGS gage #124529900, Entiat River near Entiat (Keystone gage); USGS gage #12452800, Entiat River near Ardenvoir (Stormy gage), and USGS gage # 12452890, Mad River at Ardenvoir (Mad near Mill Camp gage). Table 2 summarizes the instream flows that were established and codified in rule for WRIA 46.

In addition to protecting aquatic resources through establishment of these instream flows the EWPU elected to further protect peak runoff, over an above the biologically-based levels in the table above. WAC 174-546 (Section 080, Maximum Future Allocation) protects the natural cycle of peak runoff necessary for channel forming processes, salmon out-migration, and other ecological functions by limiting the amount of water that can be allocated to future uses during the peak runoff period. Additional strategies and actions were identified in the WRIA 46 Plan to assure that aquatic resources would be protected and, when possible, enhanced in the watershed. Please see the additional actions and strategies section of this DIP for more information.

Table 2. Instream flows (in cubic feet per second) developed for WRIA 46 and established through adoption of Chapter 173-546, WAC on August 3, 2005.

Month	Days	USGS Gauge #12452990 Lower Entiat nr. Entiat, RM 1.4	USGS Gauge #12452800 Upper Entiat nr. Ardenvoir, RM 18	USGS Gauge #12452890 Mad River at Ardenvoir RM 0.35
January	1-31	185	175	32
February	1-29	185	175	32
March	1-15	185	175	32
	16-31	250	285	68
April	1-15	250	325	100
	16-30	350	375	100
May	1-15	474	375	100
	16-31	720	375	100
June	1-15	898	325	100
	16-30	617	325	100
July	1-15	359	275	68
	16-31	268	275	68
August	1-15	185	275	68
	16-31	185	275	51
September	1-30	185	175	32
October	1-31	185	175	32
November	1-30	185	175	32
December	1-31	185	175	32

5.2 Communication with Municipal Water Rights Holders [90.82.048]

Watershed Planning Act language states that timelines and interim milestones in a detailed implementation plan required by RCW 90.82.043 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 [not currently in use], 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. A planning unit must ensure that holders of water rights for municipal water supply purposes not currently in use are asked to participate in defining the timelines and interim milestones to be included in the detailed implementation plan.

The intent of the WPA is to assure that any instream flow setting or water resource management decisions developed by a planning unit consider how much additional water use might occur from activation of additional connections to existing municipal (Class A) water supply systems, and how that authorized additional use will be met. Chapter 90.03.015 RCW defines a municipal water supply as the beneficial use of water for: (a) fifteen or more residential service connections or for providing residential use of water for a nonresidential population that is, on average, at least twenty-five people for at least sixty days a year; (b) for governmental or governmental proprietary purposes by a city, town, public

utility district, county, sewer district, or water district; or (c) indirectly for the purposes in (a) or (b) of this subsection through the delivery of treated or raw water to a public water system for such use.

Class A municipal water systems in WRIA 46 include Community and Transient Non-Community (TNC) types. Community or non-community is determined by whether use occurs on a regular/continuous basis, e.g. in a city, or irregular basis, e.g. at a campground. Class A systems are defined as either active or inactive at any given time.

Information about Class A water systems is available from the Washington State Department of Health, Division of Environmental Health, Office of Drinking Water through an online interface available at: www4.doh.wa.gov/SentryInternet/FindWaterSystem.aspx. A summary of the existing Class A water systems within the Entiat WRIA and Chelan County is found in Table 3.

Table 3. Summary of Class A Municipal Systems in WRIA 46, Chelan County.

Water System Name	WS Group	WS Type	WS Status	WS Effect	Act Src	Exceed-ences	Comp Act	Pop Count	Conn Count
Ardenvoir	A	Comm	InAct	10/1/1982 0:00	0	Y	N	150	25
Turtlerock Homeowners Association	A	Comm	Act	10/1/1982 0:00	1	Y	N	133	44
City of Entiat	A	Comm	Act	10/1/1982 0:00	3	Y	Y	985	493
Keystone Canyon	A	TNC	InAct	10/1/1982 0:00	0	N	N	10	8
Rocky Reach Dam	A	TNC	InAct	10/1/1982 0:00	0	N	N	0	1
Silver Falls #2	A	TNC	InAct	10/1/1982 0:00	0	Y	N	0	1

Three active community Class A systems are present in WRIA 46. One system, designed to serve 150 people via 25 connections, is currently inactive. Additional water supply needs associated with potential future reactivation of this community system will be provided via the reserve of water for domestic purposes provided in Chapter 173-546, WAC. The City of Entiat and residents of Turtle Rock Estates receive their water from the two active Class A community systems within WRIA 46. These active Class A community systems, however, draw their water from the Columbia River. Therefore, Chapter 173-563 WAC governs how any additional water needs associated with future expansion of these systems will be met.

Three inactive transient non-community systems also exist within WRIA 46. The Rocky Reach dam systems draws water from the Columbia River; therefore, water needs required for activation would also be governed by Chapter 173-563 WAC. The volume of water that would be required for future activation of the two other inactive systems is very small. The reserve established in Chapter 173-546 would assure any potential future need is met.

Communication with Class A municipal water right holders was ongoing throughout the EWPU's instream flow development and rule making process. Newsletter articles and mailings were sent to all landowners within the Entiat valley to notify them about the instream flow setting process, proposed Entiat water resource management strategies, projected future water needs, and how the Entiat rule will meet the needs of existing water

users as well as provide for future domestic, commercial and agricultural uses. Public meetings and hearings were also held to assure communication and feedback from water right holders.

Due to the fact that the EWPU and the public developed instream flow recommendations and initiated and completed rule making for Chapter 173-546 prior to completion of this DIP, and communication with municipal system owners/managers occurred during that process, no specific timelines and interim milestones for additional communication have been defined. Regardless, the EWPU intends to continue its communication with municipal systems and provide additional information to them about the relationship between Class A municipal systems, beneficial uses of municipal water, and EWPU water resource goals.

5.3 Additional Strategies and Actions

As noted previously, the WRIA 46 Plan identified many other actions designed to help meet water quantity and instream flow goals, achieve salmon recovery objectives, attain compliance with State and Federal water quality regulations, and enhance and protect the overall health of the Entiat and Mad River watersheds. This section briefly highlights additional actions and strategies developed by the EWPU to improve watershed conditions within the Entiat subbasin. Refer to Appendix A for a complete listing of all WRIA 46 watershed plan recommendations.

5.3.1 Water Quantity and Instream Flows

In order to assure that the reserve of water defined in Chapter 173-456 was not the sole means to provide future water availability within the Entiat subbasin, the following types of activities were also recommended for implementation:

- Explore options for use of the State Trust Water Program, USBR water leasing, and other banking options
- Address uncertainties in the water rights and claims record on a case-by-case basis, via general adjudication, or through other legal means that may become available to clean up the paper record.
- Provide information to the community about water rights/water law, the Entiat instream flow rule and Reserve water, water conservation measures, and technical and cost-share opportunities available for landowners related to water metering, irrigation water management and efficiency improvement options, etc.
- Continue to explore multi-purpose water storage options via feasibility assessment

5.3.2 Water Quality

Protecting the good water quality of the subbasin is a priority of the Planning Unit and the Entiat community. Water quality actions recommended to protect human and aquatic health include:

- Perform additional data collection related to pH fluctuations, pesticides levels in the Entiat River, toxics bioaccumulation levels in fish, and macroinvertebrate community composition and population in the Entiat subbasin
- Promote and implement projects that improve water temperature conditions for aquatic species
- Host workshops and community events about Best Management Practices related to herbicide and pesticide application, nutrient management, and potential water quality issues associated with human population growth and development.

5.3.3 Habitat

The EWPU developed numerous restoration actions designed to improve the quality and quantity of aquatic habitat, particularly for ESA listed fish species within the subbasin. Activities to improve upland wildlife habitat and overall watershed condition were also considered. Suggested habitat restoration efforts include:

- Restore channel shape, width-to-depth ratios, and aquatic habitat complexity through strategic implementation of instream structures and Large Woody Debris complexes, and reconnection of side-channel habitats and floodplain where feasible.
- Restore riparian habitat through streamside revegetation projects with willing landowners, and protect properly functioning habitat areas using mechanisms that do not conflict with community goals for property tax base retention, etc.
- Replace surface water diversions and culverts that present fish passage problems, and address unscreened/inadequately screened pumps and diversions as necessary.
- Conduct community outreach about the importance of riparian areas and wetlands, aquatic and upland habitat actions that will improve conditions for fish and wildlife species and native vegetation, and provide information on cost-share and technical assistance programs available to private landowners.

5.4 Research and Studies

The EWPU identified and recommended a number of research and study activities in the WRIA 46 Plan. Although all additional data collection and analysis that is conducted will contribute to the Entiat adaptive management process, not all research and study actions are immediate priorities. For example, although a reassessment of livestock access to streams should be performed and would help target future information sharing about Best Management Practices, initiating pH data collection is more important in the near-term due to the Entiat's current 303(d) - water quality impaired - listing for pH.

The EWPU rated WRIA 46 Plan research and study activities as either "High [priority]" or "Medium [secondary]" based on the following:

- **High:** These research activities have already been initiated, will help fill critical data gaps, and will inform ongoing regulatory compliance and salmon recovery / fisheries management discussions.
- **Medium:** These studies are important to the EWPU and will result in new information and facilitate adaptive management; however, they are not priority near-term activities (given existing staffing and funding levels).

Table 4 provides a summary of research and study activities, priority and rationale for designation, and partner agency information.

Note: The current contact(s) column identifies EWPU partner entities that are leading or have led previous research or study initiatives. This designation does not commit the entities listed to future lead role, participation or funding obligations.

Table 4. Research and study priorities for WRIA 46.

Research or Study Acton	WRIA 46 Plan Recommendation and Page Reference	EWPU Priority (and Rationale)	Current Contacts
Explore surface and ground water storage options and identify potential surface or sub-surface confined or unconfined alluvial aquifer sites	9.3 (6), p. 9-8	**High** ($450,000 awarded by WDOE; study initiated by EWPU in Fall 2005)	CCCD
Investigate extending City of Entiat municipal water system and Entiat Irrigation District irrigation distribution systems upstream	9.3 (4), p. 9-7	**High** (PUD and EID investigating options; PUD providing exploratory support)	Chelan PUD Entiat Irrigation District
Study the levels of pesticides of concern that are used in the subbasin.	9.5 (7), p. 9-19	**High** (2006 legislative funding awarded to USDA; Tied to water quality compliance, salmon recovery)	WDOE WSDA
Collect whole-fish and fillet samples at sites representative of conditions in the mainstem Entiat to reevaluate levels of DDT and PCB contamination and evaluate potential human risk.	9.5 (6), p. 9-18	**High** (Tie to WSDA-WDOE pilot pesticides study; WDOE slated to resample Entiat subbasin in 2008)	WDOE
Continue annual salmon carcass collection and DNA sampling.	9.4 (8), p. 9-15	**High** (Ongoing, tied to salmon recovery / fisheries management	USFWS
Support USFWS proposal for bull trout genetic studies	9.4 (8), p. 9-15	**High** (Tied to salmon recovery / fisheries management	USFWS
Continue data collection / studies of steelhead-rainbow population in Entiat subbasin		**High** (Ongoing; tied to salmon recovery / fisheries mgmt)	WDFW USFWS
Perform additional Entiat EDT model runs for steelhead, other fish species	9.4 (7), p. 9-14	Medium (Not critical in near-term)	Yakama Nation WDFW
Continue abundance and distribution studies on native fish species of interest (lamprey, cutthroat)	9.4 (8); p. 9-15	Medium	USFS
Establish baseline macroinvertebrate community information at multiple sites to assess overall health of the subbasin	9.4 (14), p. 9-16	Medium (Data gap, but not critical in near-term)	EWPU
Use existing FLIR data to help evaluate cold-water influences as thermal refugia for salmonids during periods of high water temperature within the system	9.5 (2), p. 9-17	Medium (Not critical in near-term)	EWPU

Table 4. Research and study priorities for WRIA 46 (continued).

Research or Study Acton	WRIA 46 Plan Recommendation and Page Reference	EWPU Priority (and Rationale)	Current Contacts
Find willing participants to continue domestic well monitoring and try to fill in geographic gaps with new participants	9.3.1, p. 9-9	Medium (Not critical in near-term)	CCCD EWPU
Study flows through alluvial fans, water exiting the watershed as surface vs. ground water. Perform additional gain-loss analyses.	9.3 (7), pp. 9-8 and 9-9	Medium (Not critical in near-term; part may occur as Part B of ongoing water storage study)	EWPU
Support USFS Entiat Experimental Forest projects in order to collect additional watershed process data	9.3.1, p. 9-10	Medium (Not critical in near-term)	USFS PNW Forestry Sciences Research Lab
Initiate sediment budget, sediment transport, and/or analysis of bedload dynamics	9.4 (9), p. 9-15	Medium (Not critical in near-term)	USFS PNW Forestry Sciences Research Lab
Reassess and map areas of livestock access to streams	9.6 (2), p. 9-20	Medium (Not critical in near-term)	CCCD EWPU
Check areas of sub-irrigated pasture identified in CWU 2002 assessment against actual conditions; update NWI data and maps to reflect actual.	9.3 (7), p. 9-8; 9.4 (3), p. 9-12	Medium (Not critical in near-term)	CCCD

5.5 Outreach and Education

As part of its watershed planning effort, the EWPU defined a number of outreach and education activities that should be conducted to enhance community knowledge of watershed issues, the Entiat watershed planning group and process, and provide information about ongoing restoration and project cost-sharing/funding assistance. The schedule and priority for outreach activities will be dictated by the EWPU's near-term tasks and early implementation efforts, described in Section 7.0.

Table 5. WRIA 46 Plan outreach and education recommendations.

Recommended Actions	Plan Ref
Encourage expansion of participation on the Planning Unit via outreach to other stakeholders/community members in order to assure its continued success and support of plan recommendations	9.2
Water Quantity & Instream Flows	
Host community workshops to share information about the WRIA 46 water rights and claims data, and water resource management goals in the Entiat subbasin	9.3(2)
Promote community water metering to record actual water use and provide a means to monitor gains in efficiency and losses attributable to new uses or changes in system operation	9.3(2)
Host and support workshops defining the state trust water program/other acquisition program, water right lease & transfer options, and similar opportunities.	9.3(3)
Encourage all Entiat River watershed water users to work to convert open irrigation systems to piped systems, and EWPU agency assistance options.	9.3(4)
Promote water efficient landscaping, and host a workshop and/or trade show available to local water users	9.3(4)
Habitat	
Perform public outreach to inform community members about the reasons for and benefits of maintaining riparian vegetation.	9.4(2)
Inform community members about cost-share on revegetation projects or easement renting	9.4(2)
Develop streamside revegetation partnerships with willing landowners.	9.4(2)
Encourage voluntary landowner efforts to control noxious weeds on their lands.	9.4(11)
Host a workshop providing guidance to landowners in the Entiat River subbasin as to the means to promote land practices that are beneficial for wildlife; protect and restore riparian and terrestrial lands; and provide information about how to mitigate land use actions such that riparian and terrestrial species thrive	9.4(12)
Provide information to the public regarding the identification, significance, and protection of plant resources in the Entiat WRIA	9.4(13)
Water Quality	
Inform community members about farm bill programs related to nutrient management and potential cost-sharing	9.5(3)
Host a workshop regarding pesticide use and recent federal decisions, and potential effects on best management practices in the Entiat River watershed	9.5(7)
Inform the public about sanitation issues, e.g. septic systems and the importance of proper septic location; livestock BMPs (see 9.6, item 2)	9.5(8)
Additional Management Issues	
Inform the public about hazards of construction in flood-prone areas, particularly where new construction is in or adjacent flood-prone areas	9.6(1)
Provide the public with information regarding fire prevention, planning and protection (e.g. development of a defensible space and fireproofing structures)	9.6(4)
Continue public education of disaster management and evacuation protocols	9.6(4)
Inform the public about the Columbia Breaks Fire Interpretive Center	9.6(4)

The District is responsible for maintaining a database used for Entiat Planning Unit minutes mailings. Mailings are distributed quarterly to all interested parties in order to keep them apprised of EWPU discussions, activities and upcoming events. Currently, over 130 people, including many residents of the valley, receive EWPU quarterly meeting minutes. The District uses Entiat public meetings and other forums to grow its mailing list.

Articles highlighting ongoing EWPU activities, natural resource issues of concern, and other relevant topics are written on a regular basis for inclusion in the Conservation District newsletter, which is mailed out quarterly to residents of Chelan County. The newsletter is always sent to residents that are served by the mail carrier routes for the Entiat valley. During implementation, Conservation District staff will continue to provide information to community members via the District's newsletter.
For very important events, such as the informational sessions that were held in conjunction with rule making, and the recent community scoping meeting held in conjunction with the ongoing Entiat Multi-purpose Water Storage Assessment , the District utilizes radio Public Service Announcements (PSAs) and prints notices for publication in local newspapers such as the Wenatchee World.

Entiat Planning Unit landowner and technical committee members also perform outreach about the EWPU's activities through presentations at watershed restoration and natural resources related conferences, in order to share information with a larger audience. This type of activity is ongoing, and will also be continued during implementation.

The Conservation District participates annually in the Chelan County Fair and Salmon Fest. Information boards and displays are utilized to highlight the watershed restoration actions and activities that the District supports in Chelan County, including Entiat watershed planning unit efforts. The District is currently working with the USFWS to establish an informational display about EWPU activities at Entiat National Fish Hatchery open-house/community days in order to create another venue for information sharing with members of the Entiat community and other residents of Chelan County.

Information is also available to the public on the Conservation District's website. The District has established a page of the site specifically devoted to Entiat Watershed Planning Unit activities. The WRIA 46 Plan is available on the website www.chelancd.org/watershed.htm, and many technical reports relevant to the Entiat subbasin may also be accessed via the website. The District is currently working to develop enhancements to the EWPU portion of its website. This work will continue over the long-term.

Other internet-based options for information sharing are also under development. With assistance from Chelan County, the District is initiating use of web-based project tracking software to share details about the type and location of completed and ongoing projects within the Entiat subbasin. Once all Entiat project information has been entered, partner agencies and members of the general public will be able to query and retrieve Entiat restoration project information online.

Other less formal forms of outreach and education are also utilized by the District and members of the EPWU. These include telephone conversations and on-site discussions with property owners. All of the aforementioned activities will continue during implementation.

6.0 ORGANIZATIONAL RESPONSIBILITIES

The Planning Unit agreed that "the base structure for plan implementation (Phase 4) should at a minimum consist of continuing the Planning Unit's role as the overall coordination and advisory group, and the CCCD's role of administrative and project support" (CCCD 2004). Therefore, the EWPU's general organizational structure (initiating governments, landowner steering committee, technical subcommittees, and watershed coordinator) will remain and continue to rely on the Chelan County Conservation District (CCCD or District) as lead agency for Entiat watershed efforts in order to assure continuity and retain overall process stability.

The District's responsibilities as lead agency for the EWPU process include: Entiat watershed project identification and development; grant sponsorship; administrative and fiscal management of funds; coordination of project and research activities; project permitting and implementation oversight; and public outreach regarding the EWPU's efforts to implement the WRIA 46 plan. The CCCD is also able to provide technical assistance and some cost-sharing to help landowners install projects, develop farm plans, etc.

As part of the Planning Unit, initiating government and technical subcommittee entities provide policy guidance, technical and funding assistance, and other means of support to the EWPU. Technical agency members of the Planning Unit will retain responsibility for: assisting with the production and/or review of technical work products; providing overall science-based guidance to the Entiat Planning Unit and its development and implementation of restoration activities; and supporting project, research, monitoring and adaptive management activities as they are able within agency funding constraints. Similarly, the City of Entiat, Chelan County, and Entiat Irrigation District have agreed to retain their initiating government roles and continue to coordinate their policy and planning activities in a manner that compliments and helps support overall EWPU goals.

Federal, tribal, state and local government EWPU members have authority over different aspects of project implementation. Due to the collaborative process and multiple partnerships that the EWPU utilizes to implement actions, it is impossible to list all of the parties that may be involved with implementation. Table 6 details some of the primary authorities and roles that participating EWPU entities have related to watershed planning and implementation, as well as the general sources of funding they are able to leverage to support EWPU activities. Appendix E, excerpted from the draft upper Columbia region salmon recovery plan (UCSRB 2005) and modified to include only programs that are currently relevant to the Entiat subbasin, provides much more detail on organizational roles and responsibilities.

6.1 Coordination and Oversight [RCW 90.82.043 (3)]

The multi-stakeholder EWPU forum is the central mechanism for oversight of the Entiat implementation process. While the EWPU is collectively responsible for approving and providing overall direction to Entiat watershed restoration projects and research/monitoring actions, the CCCD handles day-to-day operations necessary to sustain the EWPU's activities. The CCCD will continue its coordination and oversight responsibilities, and remain the primary contact for EWPU sponsored events and information on Entiat watershed activities per the WRIA 46 Plan recommendation that "state, federal, tribal, local government, foundations, local contributions and other funds should be secured to continue to support the [CCCD's] Planning Unit coordination, administration and facilitation roles and staff technical assistance…." (CCCD 2004)

Table 6. Authorities and roles of select EWPU entities, and sources of funding support.

Agency/Group	Authority/Role	Funding Source
Chelan County Conservation District	• Serve as lead agency for Entiat Watershed Planning Unit and implementation activities under Chapter 90.92 RCW. • Maintain Entiat/EWPU GIS datasets and serve as general data clearinghouse for Entiat information. • Provide technical and farm planning assistance to landowners, and help secure cost-share/grant funds for BMP implementation. • Develop / host / participate in natural resource related outreach and education activities. • Perform field data collection in support of project and monitoring activities • Help manage Ecology Entiat enhanced stream flow gaging network. • Provide local administration of Ecology water metering assistance grant program. • Secure grant funds for project implementation in support of watershed planning, salmon recovery, and Conservation District long-range plan activities.	Ecology Phase 4 grant funds; general WA Conservation Commission/ County operating funds; grant funds and partner agreements.
Entiat Landowners Steering Committee	• Provide overall community guidance and input to EWPU process • Promote EWPU activities and community involvement • Participate on Chelan County lead entity citizen review panel, WVC IRIS board, and other local advisory groups.	Voluntary /unfunded
Upper Columbia Regional Technical Team (RTT)	• Provide research and monitoring guidance and input to EWPU process • Provide technical assistance to those securing funding for research, monitoring and evaluation activities in the Entiat subbasin. • Act as a link between local EWPU activities and larger regional and state R, M & E initiatives. • Provide technical assistance in local-to-regional level salmon recovery planning/fisheries mgmt. dialogues.	Voluntary RTT participation in EWPU activities.
Chelan County	• Develop and implement county programs to manage and protect natural resources • Develop salmon habitat project lists, establish citizen review process, and help identify funding. • Develop and administer County Comprehensive Plan, Zoning Resolutions, Critical Area Ordinances, Shoreline Master Program, and other land use planning policies. • Maintain county roads and roadside ditches to minimize/prevent sediment delivery to streams • Assist with tracking water and land use changes, particularly growth and new construction • Regulate riparian/shorelines and building activities.	County general funds, federal Title III funds, state lead entity funds, legislative appropriations, grants, other
Ecology	• Implement Entiat water resources rule and perform water rights administration • Perform ambient water quality monitoring. • Operate Entiat enhanced stream flow gaging network. • Provide technical assistance and funding to landowners for water quality/BMPs • Announce and orchestrate funding cycles for the Centennial Clean Water Act, Section 319 Fund, Washington State Water Pollution Control Revolving Loan Fund Programs, Watershed Planning Act, other grants and special legislative funding appropriations. • Enforce state Water Pollution Control Act (RCW 90.48) and other regulations.	State operating funds and legislative appropriations

Table 6. Authorities and roles of select EWPU entities, and sources of funding support (continued).

Agency/Group	Authority/Role	Funding Source
USFWS	• Craft and implement Entiat National Fish Hatchery HGMP and manage and monitor artificial production programs at the Entiat National Fish Hatchery. • Conduct annual fish population monitoring/data collection and research • Implement bull trout/salmon recovery plan objectives related to bull trout management • Announce and orchestrate funding cycles for grant programs such as Partners for Fish & Wildlife, FRIMA, FONS. • Act as Co-manager for fisheries and wildlife resources • Provide technical and project development assistance for habitat restoration actions supporting recovery goals, WRIA 46 and Entiat subbasin plan objectives; help securing restoration funds. • ESA permitting and enforcement	Federal operating funds and legislative appropriations
USFS Wenatchee National Forest	• Implement WNF Plan as amended by the NW Forest Plan (and aquatic conservation strategy) including: o Road Management o Watershed Restoration o Riparian Management o Recreation Management • Perform monitoring and provide technical support • Meet obligations identified in 2000 Ecology/USFS water quality Memorandum of Agreement. • Meet tribal treaty lands trust obligations • Upland vegetation management and restoration on federal lands	USFS federally appropriated funds, partner grants and agreements.
Yakama Nation	• Act as Co-manager for fisheries and wildlife resources • Provide technical and project development assistance for habitat restoration actions supporting tribal recovery goals, WRIA 46 and Entiat subbasin plan objectives; help securing restoration funds.	
WDFW	• Provide technical assistance that leads to successful habitat restoration projects. Issue hydraulic project approval (HPA) for habitat restoration projects and work through any issue(s) that may arise. • Perform fisheries management data collection and planning • Enforce hydraulic permit criteria and state fish and wildlife management regulations • Announce and orchestrate funding cycles for the Landowner Incentive Program (LIP), FRIMA, and other grants. • Act as Co-manager for fisheries and wildlife resources	State operating funds and legislative appropriations
Chelan-Douglas Land Trust	• Craft and implement conservation easements and other long-term habitat protection agreements with interested private land owners of Chelan and Douglas Counties.	Grant and other funds.

The Entiat Landowner's Steering Committee will retain responsibility for community oversight of the Entiat watershed process, communicating Entiat landowner issues and priorities to the District and Planning Unit, providing local review of activities, lobbying for the Entiat's efforts within political and legislative arenas, and helping to promote/assure use of the local EWPU forum to address key resource concerns. Members of the LSC also participate on the citizen-based committee that helps establish funding priorities for salmon recovery projects proposed in Chelan County. EWPU landowner representation on the Chelan County citizen committee assures that Planning Unit priorities for habitat restoration are communicated from the local to the County level. The role of the Entiat LSC remains a crucial component of the overall EWPU process and the group's success, as voluntary participation in and support of efforts by the Entiat community forms the foundation for successful implementation of WRIA 46 plan actions.

Technical subcommittee members will retain responsibility for providing guidance to the EWPU based on the best available science. Monitoring related expertise will also likely be provided, as feasible, by members of the Upper Columbia Regional Technical Team (RTT). Overall direction to research and monitoring activities will continue to be provided through EWPU discussion and consensus.

6.2 Eliminating Duplication [RCW 90.82.043 (4)]

Because the Entiat plan contains numerous recommendations related to fish habitat improvement and salmon recovery, there is direct nexus between the EWPU's watershed-level implementation activities and ongoing county and region-wide salmon recovery efforts.

Under ESHB 2496, the Salmon Recovery Act, Chelan County is designated as the lead entity for salmon recovery planning efforts. As lead entity for salmon recovery activities, the County is tasked with development of county-wide habitat restoration project list, establishing a committee for citizen-based evaluation and prioritization of projects proposed to promote salmon restoration, and helping to identify funding sources for projects. The County is also a member of the Upper Columbia Salmon Recovery Board (UCSRB), which provides policy guidance to the region related to salmon recovery activities.

The County's role as an initiating government member of the Planning Unit, authority for local land use planning and policy revisions, and designation as lead entity facilitates coordination between Entiat watershed restoration efforts and larger county- and region-wide planning and policy activities, such as critical areas ordinance updates and the regional recovery planning process. The County is well suited to support EWPU project implementation actions through financial and staff assistance, grant sponsorship, land use planning expertise, and policy guidance.

The District will continue coordinating with EWPU members and partners during the implementation to assure that technical and funding resources offered/enabled by the County and other entities are leveraged in a manner that provides the most value to the EWPU's ongoing activities; that proposed project actions fit within the Entiat implementation strategy and are coordinated through the District and Planning Unit; and that lead agency functions currently being performed by the District are not duplicated. The same level of coordination will be necessary between the District/EWPU and research and monitoring entities, such as the UCSRB RTT and USFS PNW Forestry Sciences Research Laboratory, to help assure that new research and monitoring efforts utilize existing local data, are not duplicative, and meet the priority needs identified by the EWPU.

7.0 EARLY IMPLEMENTATION EFFORTS

The Entiat Watershed Planning Unit, through its partnership with local valley residents, has already implemented a number of watershed restoration actions. This section highlights efforts that have recently been completed or are ongoing, outlines lead/support agencies that are involved, and also includes information about activities that have some degree of funding support associated with them.

7.1 Completed Actions

Chapter 173-546 WAC, which established instream flows, a reserve of water to meet future uses, and a maximum future allocation to protect peak hydrograph functions in the Entiat subbasin, was codified by WDOE on August 3, 2005 and became effective September 3, 2005. Many water resources and instream flow management goals of the EWPU have been met via the creation of Chapter 173-546

Recent (2001-2005) habitat restoration activities completed on private landowners' properties within the Lower Entiat AU (RM 0.0 - 16.2) and Middle Entiat AU (16.2-33.8) include:

- Installation of instream structures including rock cross-vanes, rock and wood clusters, barbs, and engineered log jams to restore aquatic habitat complexity, reduce accelerated bank erosion, and improve channel width-to-depth ratios;
- Construction of two (2) new off-channel areas and a rearing pond to benefit juvenile salmonids; and
- Native shrub and tree planting along > 1000 feet of stream bank to help restore riparian function and shading.

With respect to federally managed lands within the Entiat subbasin, the USFS Entiat Ranger District is has implemented road and trail improvements and other uplands management actions, such as fuels reduction, to help address overall watershed health issues.

A much more detailed summary of aquatic and uplands related actions completed across all Entiat subbasin ownerships during the period 1991-2004 may be found in Appendix F.

7.2 Ongoing Actions

The USFS Entiat Ranger District is continuing to implement uplands management actions within the Entiat subbasin, such as fuels reduction planning and projects. The USFS is also working to implement its recently developed "Respect the River" program to educate recreational users about riparian protection, managing and restoring riparian vegetation, reducing stream bank erosion, and improving floodplain water storage.

Examples of EWPU "early implementation" activities and planned near-term (2006-2008) actions include:

1. Ongoing Information sharing with members of the Entiat community. Events will continue to be hosted either in conjunction with specific proposed actions, or to enable updates and feedback on progress, data collection, etc. Mailings and newsletter articles are also utilized to facilitate adaptive management.
2. Chelan County is providing implementation assistance on projects that have a land use management component (transfer of development rights, conservation

easement, rezoning, etc.), and is working to coordinate critical areas updates, other land use planning efforts and pilot program activities, e.g. habitat farming enterprise, with the EWPU.

3. The Chelan-Douglas land trust and other entities, e.g. USFS and CCCD are actively involved in riparian and upland vegetation restoration activities. The USFS and Fire District No. 8 have initiated cooperative Federal and Community Wildfire Protection Planning to identify fuels reduction and "FireWise" projects to restore stand health and enhance community protection from wildfire.
4. An Implementation Plan for the Entiat water resources rule was developed by the Conservation District and Ecology. Members of the EWPU are currently involved with implementing and starting to track the Entiat Water Resources Management Program, Chapter 173-546 WAC.
5. An Entiat Multi-purpose Water Storage Assessment was initiated with $450,000 in funds awarded by WODE. Data assembly and documentation for Step A of the study began in fall 2005, and a community scoping meeting was held in January 2006. Screening criteria development and selection of sites for further examination is ongoing.
6. The Conservation District is working with Chelan County, the Chelan-Douglas Health District and Ecology to implement a pilot water tracking system that would help better assess new exempt well installation associated with new construction. The pilot program will aid overall tracking of Chapter 173-546 WAC and reserve amounts. Discussion about how to implement other WRIA 46 programmatic water resource management recommendations will continue.
7. Members of the EWPU, with the help of fisheries co-managers and regulatory agencies successfully initiated Entiat-specific fisheries management discussions in December 2004. The discussion resulted in additional meetings in 2005, and acknowledgement that a "fisheries white paper" and more data collection by the co-managers would facilitate information sharing and exploration of the potential for additional recreational and tribal harvest opportunities within the Entiat subbasin.

   The fisheries white paper effort will include a literature review, summary of historic fishing activities and management practices in the Entiat subbasin, and current status of tribal and recreational fisheries. This Entiat-specific document will serve as a supplement to the locally produced Entiat WRIA 46 Management Plan, provide the basis by which to evaluate the feasibility of reopening fisheries in the Entiat subbasin, and help form the foundation for development of a WDFW fisheries management plan. Special legislative funding requests for additional research and preparation of a white paper were made in 2005 and 2006; however, no funding has been secured to date.
8. The Knapp-Wham partnership irrigation ditch company is actively working with the Hanan Detwiler partnership ditch company to explore options for system consolidation and efficiency improvements by either piping or eliminating the existing Hanan Detwiler open ditch delivery system. An appraisal level engineering report has been completed, engineering design is scheduled for 2006, and funding for consolidation construction is being actively pursued.
9. The Entiat Irrigation District is working with the Chelan PUD to investigate the potential of extending the EID service line upstream to serve irrigators in a portion of the lower Entiat River with water from the Columbia River. Discussions between the EID and Chelan PUD are ongoing, and the PUD is providing technical assistance to the EID to help explore options.

10. The USBR and CCCD began working with landowners to evaluate the potential for conversion of surface water diversions for irrigation to well systems. These projects will result in fish population improvements and irrigation water savings. Chelan County sponsored BPA FY2005 within-year proposals for the conversion of two surface water diversions to groundwater wells/systems, and the proposal was recently approved for funding by the BPA. Installation of new wells is anticipated to occur in 2006.
11. The Conservation District, on behalf of the EWPU, secured $102,000 in funding from the Salmon Recovery Funding Board and $20,000 in funding from WDOE for implementation of Phase I of the Bridge-to-Bridge reach restoration project. A modified rock-cross vane is scheduled to be installed in fall 2006 to increase habitat complexity and decrease channel width-to-depth ratios, which in turn will help moderate water temperature extremes. The Bureau of Land Management contributed $20,000 to Phase 1 of the Bridge-to-Bridge effort, and Chelan County has dedicated $100,000 to the overall Bridge-to-Bridge project.
12. In fall 2005, Entiat community members, CCCD staff and County funding support enabled engineering survey and cross-sectional data collection from RM 1.4 to RM 6.8 of the lower mainstem Entiat River. The USBR is in the process of using the data to perform sediment and hydraulics modeling, and prepare an appraisal level report of additional instream restoration opportunities and potential sites for implementation. The USBR study is due to be finished in late spring - early summer 2006.

    To support new project development, the Conservation District secured $58,000 in funding for preliminary engineering and development of landowner agreements, permitting documents from the Rocky Reach Tributary Fund in January 2006. This funding will be used to springboard implementation of instream restoration activities recommended in the to-be-completed USBR study.

    Lastly, the Chelan County Natural Resource Program, on behalf of the District and EWPU, secured $250,000 in funding from the Salmon Recovery Funding Board and the Rock Reach tributary fund in January 2006 for the installation of five additional rock instream structures in the Lower Entiat AU and five large woody debris structures in the Middle Entiat AU. County-District discussions regarding project sponsorship, appropriates site and staff roles during implementation are ongoing.
13. In 2005 the CCCD and EWPU technical partners identified opportunity for off-channel rearing habitat enhancement in the lower Entiat AU (~RM 5) that could occur if conversion of an existing surface water diversion and pump to a well system. The project would involve six private landowners. A grant proposal for the restoration project was submitted in January 2006, and design discussions and data collection will begin later this year
14. Private landowners in the Entiat valley have performed irrigation water application system upgrades, thereby contributing to increased instream flows. Typical upgrades include conversion from overhead impact sprinklers to more efficient micro-irrigation systems. The NRCS Environmental Quality Incentive Program (EQIP) provides cost-sharing funds for landowners to implement these and other BMPs. NRCS and Conservation District staffs are funded to prepare farm plans and provide technical assistance to landowners interested in improving their irrigation water management practices and implementing other BMPs.
15. Larger water users/irrigation system managers have begun to meter water use. Metering brings them into compliance with recent state regulations, and also provides a mechanism by which to track actual water use and any water savings that

may result from future system upgrades. The Conservation District has secured funding from the Department of Ecology to provide technical and cost-share assistance to irrigators for metering.

16. In 2005 the CCCD and EWPU technical partners began developing a habitat restoration project involving five private landowners in the Middle Entiat AU (RM 21.4). A grant proposal for the restoration project was submitted in January 2006, and preliminary survey data collection is anticipated to begin in spring 2006.
17. Through funding from the BPA Integrated Status and Effectiveness Monitoring Program, a pilot effectiveness monitoring study was initiated by members of the UCSRB RTT (with assistance from the EWPU) in the lower Entiat River. As part of the effort, minimum five year access/permission was voluntarily provided by at least 10 private landowners in the lower river. The study uses a before-after / control impact design, and will help evaluate the effect of ongoing habitat restoration activities within the subbasin.
18. In 2005 the Entiat Watershed Planning Unit was invited to submit a formal proposal to the Bonneville Environmental Foundation, a non-profit group that seeks to establish long-term support to watershed groups with strong community involvement and commitment to the use of best available science and adaptive management to evaluate their activities. The EWPU is currently working to define specific 3-, 6-, and 10-year goals and metrics that will form the foundation of an "Entiat Model Watershed" proposal for consideration by BEF.

7.3 Near-Term Tasks, Agency Roles and Funding

Priority for implementation in the near term (2006-2008) is assigned to sustaining or completing the actions that are already underway within the subbasin. Estimated timelines and milestones for completing these activities are included in Table 6, along with information regarding sources of secured/potential funding. Early implementation project numbering from above has been retained within the table.

Lead and support agency designations in the near-term table were assigned based on both current involvement and in some cases statutory management/regulatory authority to conduct or enable certain actions. ***The lead and support designations meant to highlight primary players and points of contact at the time of publication of this DIP. Such designation does not indicate that all entities listed have a binding obligation to participate in or fund future activities.***

In the funding source column, existing, anticipated and potential (applied for but not awarded) grants are described. The terms "internal" and "agency general funds" are used when support by partner government agencies is being supplied by agency budgets. It is important to note the ability of EWPU technical support agencies to provide implementation support to the EWPU may decrease in the future due to budget cuts and/or funding re-appropriations. Additional information about potential funding sources for implementation of WRIA 46 Actions is included in Section 12.2, and in Appendix J.

A more general, long-term framework designed to help guide implementation of all WRIA 46 plan recommendations may be found in Section 8.0, Long-term Implementation Framework.

Table 7. Early implementation actions, near-term tasks, supporting entities and funding sources.

Impl. Area	Action	Tasks	Estimated Timeframe	Milestones	Lead Entities[1]	Support Entities	Funding Source(s)
Subbasin-wide (programmatic)	**1. Public education and information**	Provide current information on monitoring conditions, water use trends, water quality trends, policies, and best management practices	Ongoing	Quarterly EWPU meetings Newsletter articles Community meetings	CCCD (EWPU)	Chelan Co (salmon recovery)	P4 funds, future grants
	2. Land use planning and policy development	Continue development of pilot habitat farming enterprise program; coordinate critical areas updates and other land use activities with EWPU.	Ongoing	Project land use assistance; planning /policy updates; coordination meetings	Chelan Co	EWPU CCCD	P4 Funds (CCCD), agency general funds
	3. Riparian / uplands restoration	Continue revegetation projects with willing landowners Continue coordination of Federal and local fire planning (CWPP) processes	Ongoing 2006 - 2008	New landowner revegetation projects Entiat CWPP and fuels treatment plans	CDLT CCCD USFS Fire Dist 8	EWPU	P4 Funds (CCCD), agency funds, grants
	4. Water Resource Management Program	Assess year one of Chapter 173-436 implementation.	2006	Meetings with Ecology Central Region and WRMT staff.	CCCD WDOE		P4 Funds (CCCD), agency general funds
		Develop mechanisms to track number of tentative determinations performed, progress on clean-up of paper water record	2006 - 2007	Meetings with Ecology Central Region and WRMT staff.	CCCD WDOE		P4 Funds (CCCD), agency general funds
		Examine Rule implementation plan and draft an MOU, if needed, to better delineate responsibilities for tracking implementation of Chapter 173-546	2006 - 2007	(if necessary) Draft MOU	CCCD WDOE		P4 Funds (CCCD), agency general funds

[1] Lead entity and support designations denote current involvement; designations do not indicate future entity involvement or funding commitments.

Table 7. Early implementation actions, near-term tasks, supporting entities and funding sources (continued).

Impl. Area	Action	Tasks	Estimated Timeframe	Milestones	Lead Entities	Support Entities	Funding Source(s)
Subbasin-wide (programmatic)	– Local water resource advisory / review board	Explore establishment of a local water advisory group to assess implementation of water tracking system, water resources management program, instream flows and related activities in Chapter 173-546 WAC.	2007	Meetings with Chelan Co, WDOE and LSC; Potential MOU; other approvals and resolutions, as necessary	Chelan Co WDOE	CCCD EWPU	P4 funds (CCCD), Agency general funds
		Define role(s) of a Local Water Resources Review Board, if established	2007		Chelan Co WDOE	CCCD EWPU	P4 funds (CCCD), Agency general funds
	- Water Banking and Leasing Options	Prevent water rights relinquishment and enhance flow conditions through water banking/trust and leasing	2006 - 2007	Public workshop(s)	CCCD	WDOE USBR Non-Profit	P4 funds (CCCD), Agency general funds, other.
		Develop mechanisms to track amounts of water, if any, placed into trust.	2006 - 2007	Meetings with Washington Water Trust, WA Rivers Conservancy, others	CCCD	WDOE USBR Non-Profit	P4 funds (CCCD), Agency general funds, other.
		Initiate discussions about pilot water leasing program for Entiat subbasin	2007 - 2008	Meetings with Ecology, other relevant parties	CCCD WDOE		P4 funds (CCCD), agency general funds

Table 7. Early implementation actions, near-term tasks, supporting entities and funding sources (continued).

Impl. Area	Action	Tasks	Estimated Timeframe	Milestones	Lead Entities	Support Entities	Funding Source(s)
Subbasin-wide (programmatic)	**5. Multi-purpose water storage study**	Complete Step A - Screening and identification of potential sites	2006	Report	CCCD	EWPU	WDOE water storage funds
		Develop Step B scope of work and conduct tasks	2006 - 2007	Report	CCCD WDOE	EWPU	WDOE water storage funds
		Complete Study	2008	Report	CCCD	EWPU	WDOE water storage funds
	6. Exempt well/new construction water tracking system	Implement pilot permit exempt well and new construction water tracking framework	2006	Finalize database requirements and program new fields and codes.	CCCD Chelan Co	Health WDOE	P4 Funds (CCCD), agency general funds
		Refine water tracking system if needed	2006 - 2007	Mid - and end-of-year one database info sharing and analyses	CCCD Chelan Co	Health WDOE	P4 Funds (CCCD), agency general funds
		Develop MOU, if necessary, among County, Health, and Ecology to delineate water tracking system responsibilities.	2006 - 2007	Draft MOU, if necessary	CCCD Chelan Co Health WDOE		P4 Funds (CCCD), agency general funds
	7. Fisheries White Paper & Dialogue	Seek funding	2006 - 2007	Funding secured for Entiat Fisheries White Paper	CCCD	Chelan Co	Legislative appropriation, other?
		Continue fisheries management dialogue with co-managers and appropriate fisheries mgmt. agencies	Ongoing	Meetings	CCCD WDFW YN, NOAA	USFS EWPU	P4 funds (CCCD); agency funding

Table 7. Early implementation actions, near-term tasks, supporting entities and funding sources (continued).

Impl. Area	Action	Tasks	Estimated Timeframe	Milestones	Lead Entities	Support Entities	Funding Source(s)
Lower Entiat Assessment Unit Intra-Au area below Mad River	**8. Knapp-Wham Hanan Detwiler irrigation system consolidation**	Provide coordination and updates to partnership ditch members regarding project status	2006 - 2008	Meetings with ditch water users, USBR and other partners	CCCD USBR	KW/ HD boards and water users	P4 funds; USBR tech assistance funds.
		Perform additional surveying and prepare engineering designs	2006	Surveying, preliminary and final designs completed	USBR	CCCD KW HD	USBR assistance
		Perform water rights administration, as necessary	2006 - 2007	Tentative determination/Record of Examination	WDOE	USBR CCCD KW HD	WDOE Agency funds; P4 (CCCD)
		Secure construction funds	2006- 2007	Grant proposals, award	CCCD		BPA grant funds? WDOE water conveyance?
		Permitting and ESA consultation	2007	Prepare and acquire permits, ESA materials	CCCD	USBR WDFW USFWS Others	P4 (CCCD), USBR tech assistance funds, grants
		Construction	2008	Well and delivery line installation, system consolidation	CCCD	USBR KW HD	P4 (CCCD), USBR tech assistance funds, grants
	9. Investigate Entiat Irrigation District line extension upstream to serve other users	Chelan PUD and EDI continue to investigate potential and assess options.	2006	Chelan PUD and EID determine preferred or no action alternative	PUD EID	CCCD WDOE	P4 (CCCD), agency general funds
	10. Surface water diversion (2 ongoing) conversion to wells	Assure adequate ground water supply for irrigation	2006	Drill test wells	USBR	CCCD Chelan Co	BPA FY 2005 funds
		If appropriate, covert surface water distribution system to well water pump/lines	2006 - 2007	New irrigation water delivery system	USBR	CCCD NRCS	?

Table 7. Early implementation actions, near-term tasks, supporting entities and funding sources (continued).

Impl. Area	Action	Tasks	Estimated Timeframe	Milestones	Lead Entities	Support Entities	Funding Source(s)
Lower Entiat Assessment Unit Intra-Au area below Mad River	**11. Bridge-to-Bridge Reach restoration**	Permitting and ESA consultation for Phase 1 - instream structures	Spring and summer 2006	Permits	CCCD Jones & Stokes	Chelan Co	Co Lead entity funds, BLM funds, CCCD SRFB
		Construction - Phase 1 and riparian revegetation	Fall 2006	Cross-vane and plants installed	CCCD	NRCS Wildland, Inc.	CCCD: SRFB and WDOE Huesseman grants
		Phase II and III land use planning / development rights transfer alternatives	Ongoing	Approval / mechanism by which to transfer development rights to enable Phases II & III as envisioned (w/off-channel).	Chelan Co	WDFW	Agency general funds
		Geomorphic assessment, Sediment/Hydraulics modeling from RM 6.8 - RM1.4	Spring-Summer 2006	Appraisal level report identifying suite of restoration sites/structure alternatives for Phase II/III area, other areas.	USBR	CCCD	USBR funding, P4
		Selection of best restoration scenario for Phases II and III	Summer 2006	Meeting with USBR, other engineering staff, EWPU; strategy for use of Co. SRFB funds	Chelan Co CCCD USBR	EWPU	P4 funds (CCCD); agency general funds
		Prepare and submit permit / ESA consultation documents for Phases II & III	2006 - 2007	Landowner agreements Regulatory permits/ESA documentation	CCCD, Chelan Co? J&S		Rocky Reach HCP Tributary Fund; County funds, other?
		Phase II and III construction	2007 - 2009		CCCD Chelan Co?		County SRFB funds for instream? other

Table 7. Early implementation actions, near-term tasks, supporting entities and funding sources (continued).

Impl. Area	Action	Tasks	Estimated Timeframe	Milestones	Lead Entities	Support Entities	Funding Source(s)
Lower Entiat Assessment Unit Intra-AU area below Mad River	**12. Restoration below RM 6.8, outside of B2B reach**	Geomorphic assessment, Sediment/Hydraulics modeling from RM 6.8 - RM1.4	Spring-Summer 2006	Appraisal level report identifying suite of restoration sites/structure alternatives for Phase II/III area, other areas.	USBR		USBR funding
		Selection of best restoration scenario for remainder of lower river below hatchery	Summer 2006	Meeting with USBR, other engineering staff, EWPU	CCCD USBR	EWPU	P4 funds (CCCD); agency general funds
		Obtain Landowner agreements and preliminary engineering	2006 - 2007	Landowner agreements Preliminary designs	CCCD NRCS Chelan Co? USBR?	EWPU	HCP Tributary Fund; Co SRFB funds?
		Prepare and submit permit / ESA consultation documents	2007 - 2008	Regulatory permits/ESA documentation	CCCD NRCS Chelan Co?	WDFW USFWS USACE	P4 funds (CCCD); Future project grant funds
		Construction	2007 - 2009	Installation of habitat restoration treatments	CCCD Chelan Co?		County SRFB funds? other
	13. Lower River Off-Channel Restoration	Obtain Agreements	2006 - 2007	Landowner agreements	CCCD		HCP Trib Fund, P4 (CCCD)
		Surveying and design	2006 - 2007		CCCD District Cluster Engineer		HCP Trib Fund, P4 (CCCD)
		Construction	2007 - 2008	Off-channel restoration and enhancement	CCCD District Cluster Engineer		Potential BPA project grant funds

Table 7. Early implementation actions, near-term tasks, supporting entities and funding sources (continued).

Impl. Area	Action	Tasks	Estimated Timeframe	Milestones	Lead Entities	Support Entities	Funding Source(s)
Lower and Middle Aus	**14. Irrigation water system efficiency improvements**	Assess and map status of existing upgrades	2007 - 2008	Summary and GIS dataset of existing improvements and acreages	NRCS CCCD		P4 funds (CCCD) and NRCS general funds
		Provide technical and cost-share assistance for IWM improvements and track new upgrades	Ongoing	Farm plan and EQIP sign-ups	NRCS	CCCD	CCCD and NRCS funds
	15. Water metering	Assess number of large users (≥ 1cfs) that are already metering, and encourage others to meter	Ongoing	Summary of existing meters Community outreach	CCCD WDOE	USBR	WDOE cost-share, tech assistance
Middle Entiat Au	**16. Stillwater Habitat Restoration**	Surveying and design	2006	Survey complete spring Designs for permitting by fall	USBR CCCD	WDFW USFWS	P4 funds (CCCD), USBR tech assistance, in kind
		Prepare and submit permit / ESA consultation documents	2006 - 2007	Regulatory permits/ESA documentation	CCCD	WDFW USFWS USACE	BPA grant funds? other?
		Construction and revegetation	2007 - 2008	Instream LWD structures 2007 Riparian revegetation	CCCD		Potential BPA project grant funds?
		Monitoring data collection	2007 - 2008	Baseline - 2007 Post-construction 2008	CCCD USFWS USFS		Potential BPA project grant funds
	17. Monitoring (see monitoring section)	Effectiveness monitoring	Ongoing	Annual data updates	TerrAqua RTT	CCCD	BPA ISEMP funds
		Develop overall Entiat monitoring strategy	2006 - 2007	Entiat-specific strategy / Part of UCSRB Monitoring Strategy	CCCD RTT	EWPU	P4 funds (CCCD)
	18. Long-term Sustainability and Adaptive Management	Develop detailed proposal elements	Spring 2006	Metrics and year-out goals for BEF proposal	CCCD BEF	EWPU	P4 funds (CCCD)
		Finalize Bonneville Environmental Foundation Proposal and MOU	Summer 2006	BEF proposal	CCCD BEF	EWPU	P4 funds (CCCD)

8.0 LONG-TERM IMPLEMENTATION FRAMEWORK

This section describes factors that will likely affect the overall rate and success of implementation in the Entiat subbasin, and provides a general long-term framework for implementation of all types of WRIA 46 Plan recommendations.

The implementation of almost all WRIA 46 Plan project, research, and programmatic actions requires sustaining existing and developing new landowner partnerships. The degree to which members of the Entiat Landowners Steering Committee and the larger community supports future EWPU activities, and level of participation by willing landowners will determine whether implementation can occur at strategic sites, and the overall rate at which implementation will occur within the Entiat subbasin.

In addition to strong landowner support, the EWPU's success to date is due to the technical assistance of many local, state, federal and tribal agencies. Local government and agency staff involvement, policy support, technical collaboration, and commitment to supporting EWPU activities must remain in order for implementation to occur in a strategic, coordinated manner. The District's ability to continue its overall support, administration and coordination roles for the EWPU is entirely dependent upon the availability and level of future grant funds.

The ability of the Conservation District and other EWPU partners to continue securing sources of funding/support will also affect the rate and overall success of implementation in the Entiat. Although some of the near-term project and research actions discussed previously already have funding associated with them, some are only partially funded and some lack current funding. Additionally, funding sources change over time. Future decreases in funding would/will significantly affect overall implementation success. More information about current sources of funding may be found in the Early Implementation Efforts, Monitoring, and Funding sections of this document.

Future funding levels will also determine whether monitoring and research efforts being conducted in the Entiat by partner agencies are sustained or decreased. Future technical agency budgets and research funds will determine to what extent new data collection occurs. The Monitoring section of this document provides detail about existing and proposed monitoring activities within the Entiat subbasin, costs, and priorities.

Tables 8, 9, 10 and 11, found following this section, provide an extended schedule for implementation of WRIA 46 Plan activities. Table 8 includes activities that should be implemented subbasin-wide or that are programmatic; Table 9 highlights Lower Entiat AU actions; Table 10 focuses on Middle Entiat AU implementation items; and Table 11 describes activities recommended for the Upper Entiat and Mad Assessment Units.

Descriptive information and caveats that apply to the long-term implementation tables include:

- General Location: Describes if the action should be implemented throughout the subbasin or as a programmatic activity, or defines in which Assessment Unit(s) activities should be conducted.
    - Instream structures and LWD complex projects should first be implemented within the highest priority tier of "intra-Assessment Unit" areas that have been defined for the subbasin. Refer to the geographic prioritization of actions section of this document for a description of these areas. These more specific intra-AU areas

must be applied as an additional "screen" to direct instream habitat restoration actions, e.g. placement of rock/wood structures and LWD complexes, to the highest priority areas/highest geographic tier within the subbasin.

- Project and outreach/education actions are targeted to the Assessment Unit level when possible in order to focus these efforts on the most appropriate areas of the subbasin.
- Activities that are programmatic in nature or appropriate for implementation throughout the subbasin have not been assigned to a specific Assessment Unit. Detailed monitoring parameter and limiting factor information has not been generated for these activities, either, as they are programmatic rather than project specific in nature. For subbasin-wide/programmatic actions, "Project Type" column information does not provide a link to salmon recovery plan project types; rather, it describes the proposed programmatic or planning action. Information in the Specific Action column references the suite of WRIA 46 Plan recommendations that fall under/help meet the general programmatic action.

- Monitoring Parameter: Provides a tie to the general watershed health parameter that is expected to be affected by proposed actions.
- Limiting Factors: Identifies the more specific resource issue of concern within the Entiat subbasin, particularly as it relates to salmon recovery and aquatic habitat improvements. When a resource issue and strategies to sustain or improve watershed conditions have been identified by the EWPU/WRIA 46 Plan, but actions are not necessary to address existing "limiting factors" for salmonids, the language "Sustain Properly Functioning Condition" is used.
- Project Type: Establishes a crosswalk between the types of actions proposed in the WRIA 46 Plan for implementation in the Entiat subbasin, and the recommended "Project Type" data contained within the draft Upper Columbia Region Salmon Recovery Plan (UCSRB 2005). For information regarding how specific project types (restoration actions) contribute to the recovery of ESA listed fish and Viable Salmonid Population (VSP) criteria, refer to Appendix G - Habitat Matrices - of the recovery plan (UCSRB 2005).
- Specific Action: Describes the specific action identified by the EWPU for implementation. Recommendation language from the WRIA 46 Plan was utilized to the maximum extent possible in an effort to retain the wording and intent of the EWPU strategy/action.
- WRIA 46 Plan Recommendation and Page Reference: Provides a direct cross-walk from this table to the WRIA 46 Plan recommendation(s) associated with a specific action, so that the reader is easily able to locate information within Appendix A or the Entiat plan.
- Action/Strategy timetable blocks: Depict an estimated rate and timeline for completion of activities. Estimated milestones have also been included, as appropriate. It is important to note the following:
  - ***Items listed in bold italics are outreach/education activities*** that the EWPU has recommended be conducted to share information as part of the effort to implement certain types of actions.
  - ***The overall timeframes and annual rates at which projects may be implemented are only estimates***. For example, within the Lower AU, the goal is to implement 3-5 instream structures per year during the year 1-3 timeframe and subsequent periods. Project implementation may occur at a more rapid rate, e.g. six structures annually, or at a slower rate dependent upon willing landowner participation,

funding, and the rate at which active restoration project proposals are moved through the permitting process. These initial goal numbers will be utilized by the EWPU during its implementation monitoring and adaptive management process, and EWPU assumptions about the rate at which projects may be implemented and overall time schedules will be revised accordingly in the future.

  - *Year 1 is not always assumed to be 2006; Year 1-3 actions will not all occur concurrently.* At first glance, it could appear that all actions within the subbasin listed in the Year 1-3 column are scheduled to occur over the next 3 years. However, as noted in the Near-term Actions discussion, many projects are already underway within the high priority tier of the Entiat subbasin. The completion of these Near-term Actions, and preparation for other activities within high tier areas, will be the EWPU's primary focus for the Year 1-3 implementation period. For Near-term activities described in the table, 2006 may be assumed as year 1. The rate at which activities are completed within the high priority geographic tier will determine year 1 for other areas. For example, if implementation of instream activities within the high tier areas of the subbasin takes 10 years, year 1 for medium tier areas may be 2016.

- Long-term: Describes ideal future condition and/or state of activities within the Entiat subbasin more than a decade from now.
- Cost: Estimates per project and/or total amount that implementation will cost, when an approximation could be made.
  - Numbers provided were based on existing materials and labor costs and EWPU members' experience implementing similar projects in the past or in other areas.
  - Material costs and professional rates constantly change in response to inflation and market factor adjustments; therefore estimated material and labor costs that have been provided will change over time.
  - The actual cost of implementation may exceed or fall short of the estimates provided, as expenses vary widely depending upon project complexity, size, equipment and material needs, permitting, and whether cost-sharing and in-kind services from partners can be leveraged to reduce the overall cost of implementation.

Table 8. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Subbasin-wide/programmatic activities.

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Reference	Actions / Strategies					
						Year 1 - 3	Year 3-6	Year 6-10	After Year 10	Long-Term	Cost
Subbasin Wide Programmatic			Community Involvement	Assure ongoing community participation on the Planning Unit, and general awareness of EWPU existence and efforts	9.2, p. 9-3	Perform community outreach to expand participation on and knowledge of EWPU efforts	Continue implementation of program	Continue implementation of program	Continue implementation of program	To the degree possible, valley property owners aware there is a local watershed group and generally familiar with EWPU efforts.	$1000 per year / unknown
			Instream Flow and Water Resources Program	Implement Chapter 173-546 WAC, Entiat basin water resources management program	9.3 (1), pp. 9-4, 9-5 and 9-6; 9.3 (2), p. 9-6	Share information about water resource management goals in the Entiat subbasin. Continue implementation of program	Continue implementation of program	Continue implementation of program	Continue implementation of program	Entiat water resources rule implemented through year 2025 (or altered prior to 2025 if necessary)	unknown
				Establish a reporting mechanism/ agreement between Chelan County, [WDOE, Chelan-Douglas Health District] and the CCCD to track permit exempt wells [and other new water uses] associated with growth	9.3 (1) (2), p. 9-6; 9.3.1, p. 9-9	Implement pilot water tracking program and refine as necessary	Continue implementation of program	Continue implementation of program	Continue implementation of program	Water tracking program accurately assessing new water uses and effect on reserve, and enabling adaptive management	$10,000 ($1000/year for 10 years - coordination, data compilation, analysis, and reporting)
				Establish a local water advisory group to track implementation of water resources program codified in Chapter 175-546 WAC	9.3 (5), p. 9-8	Initiate development of a community water advisory group;	Continue use of community advisory group to track rule implementation	Continue use of community advisory group to track rule implementation	Continue use of community advisory group to track rule implementation		unknown
				Identify potential surface and ground water storage options to utilize Maximum Future Allocation in Chapter 173-546 WAC	9.3 (6), 9-8	Complete multi-purpose storage assessment and potential storage site identification.	Continue implementation as appropriate	Continue implementation as appropriate	Continue implementation as appropriate	Multi-purpose water storage sites established, as appropriate, for beneficial uses	Assessment - $450,000 awarded. Implementation costs unknown.
				Investigate reclaimed water use options	9.3 (4)	City of Entiat and appropriate system managers receive training on reclaimed water use	Continue training and water planning, as appropriate	Continue training and water planning, as appropriate	Continue training and water planning, as appropriate		unknown

Table 8. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Subbasin-wide/programmatic activities (continued).

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Reference	Actions / Strategies					
						Year 1 - 3	Year 3-6	Year 6-10	After Year 10	Long-Term	Cost
Subbasin Wide Programmatic			Water Rights Management Program	Address uncertainties in the water rights and claims record, using a case-by-case basis, general adjudication, or other legal means that may become available to clean up the paper record	9.3 (2)	***Perform outreach regarding tentative determination and record of examination process associated with water right change requests, and paper vs. "wet" water, etc.***	Continue addressing uncertainties in paper water record as appropriate	Continue addressing uncertainties in paper water record as appropriate	Continue addressing uncertainties in paper water record as appropriate	Paper water record reflects actual water need/use to highest degree possible; water right holders given most certainty as possible - dependent upon method used.	unknown
				Develop a detailed water banking, trust and leasing program	9.3 (3), p. 9-7	***Host information sessions about water trust / leasing, preventing water right relinquishment;*** Initiate development and use of pilot program; 1-5 enrolled annually if feasible	Continue program refinement and promotion; 1-5 enrolled annually	1-5 enrolled annually	Continue implementation as appropriate	Water rights holders aware of and utilizing program to prevent relinquishment, enhance flows, and help serve new water needs.	unknown
			Uplands Management and Land Use Planning	Initiate Community Wildfire Protection Planning and treatments (e.g. defensible space, access to structures), especially in Wildland Urban Interface	9.6 (4), p. 9-20 and 9.6 (5), p. 9-21	***Host FireWise / CWPP workshops;*** Work with USFS, DNR and Fire District No. 8 to define WUI, develop CWPP, implement fuels reduction treatments and other actions	Implement CWPP actions	Implement CWPP actions	Continue implementation as appropriate	Entiat valley is as "FireWise" as possible; Fuels reduction, access improvement, and other CWPP actions implemented	$70,000 awarded for assessment / CWPP plan development. USFS estimate for prescribed fire $250/acre; for mechanical WUI treatments $350/acre. Total costs unknown.
				Sustain or improve terrestrial habitat conditions	9.4 (12), p. 9-16; 9.4 (3); 9.6 (1), p. 9-20	***Host workshops for landowners about land use practices that are beneficial to riparian and upland flora and fauna, land use regulations, and associated planning / permitting processes.***	Continue outreach	Continue outreach	Continue outreach		unknown
					9.4 (11), pp. 9-15 and 9-16; 9.4 (13), p. 9-16	***Provide information on the i.d., significance, and protection of native plant resources;*** Develop noxious weed control program with landowners and agencies	Continue program	Continue program	Continue program	Noxious weed populations limited or eliminated	USFS annual estimate for weed control - $75,000; upland plant restoration estimated at $2.00 per stem.

Table 8. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Subbasin-wide/Programmatic (continued).

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Reference	Actions / Strategies					Cost
						Year 1 - 3	Year 3-6	Year 6-10	After Year 10	Long-Term	
Subbasin Wide Programmatic			Uplands Management and Land Use Planning	Assure timber harvest complies with the Washington Forest Practices Act and other relevant regulations, employs BMPs, and goes through SEPA / NEPA review as necessary.	9.6 (3); 9.6 (1)	Agencies/entities should continue enforcement of their respective codes [and regulations]					unknown
				Assure that landuse actions comply with existing regulations related to habitat protection	9.4(3); 9.6(1)						unknown
				Current and future programs developed to protect and restore habitat and other critical areas are coordinated with and take into account current and future restoration and protection projects	9.4(7)	Work with regulatory entities					unknown
			Fisheries Management	Continue fisheries management dialogue with co-managers (WDFW, Yakama Nation, USFWS) and other appropriate entities (NMFS, PUD HCP Hatchery Committee)		Continue fisheries management dialogue with co-managers and others.					unknown

Table 9. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Lower Entiat Assessment Unit

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Reference	Actions / Strategies					
						Year 1 - 3	Year 3-6	Year 6-10	After Year 10	Long-Term	Cost
Lower Entiat Assessment Unit	Watershed Condition		Road Management	Decommission 14 miles of USFS roads	9.5 (10), p. 9-15			Completed		Roads & trails adequately maintained; relocated out of riparian areas or decommissioned where feasible.	$140,000
				20 miles heavy maintenance - reconstruction on USFS roads	9.5 (10), p. 9-15			Completed			$200,000
			Water Quality / Quantity Restoration (related to wetlands)	Maintain existing wetlands or enhance few remaining wetlands and their function	9.4 (3), p. 9-12; 9.3 (7), p. 9-8	***Provide information on wetland function and assistance options;*** Update NWI GIS data to reflect known, field checked wetlands	Continue mapping updates and implement wetlands projects as appropriate			To the extent possible, wetlands are delineated, mapped, rated and protected/enhanced.	unknown
	Water Quality	Nutrient Limitations	Nutrient Restoration	Continue hatchery carcass outplanting and/or use of nutrient analogs		Initiate Analog Pilot Program	Continue program	Continue program	Continue implementation as appropriate	Increased appropriate nutrient productivity	100,000
		Water Temperature Extremes (summer highs and winter lows)	Water Quality Restoration	Implement actions identified in SNTEMP study, EDT report and Entiat River Inventory and Analysis, as feasible, to help moderate temperatures	9.5 (2), p. 9-17	See Habitat Diversity / Key Habitat and Riparian				Site-specific shade increased by or up to 50%; channel width-to-depth ratios decreased	
		Sustain Properly Functioning Condition (Prevent dissolved oxygen, nutrients / pH and toxics from becoming limiting factors)	Water Quality Protection	Continue use of best management practices for herbicide and pesticide applications	9.5 (7), p. 9-19	***Host workshops regarding pesticide use, federal court decisions, BMPs***	Continue use of BMPs	Continue use of BMPs	Continue use of BMPs	Best Management Practices used for all herbicide and pesticide applications	
				Continue to assist landowners with farm plan development, including livestock BMPs and nutrient management	9.6 (2), p. 9-20	***Host info sessions on BMPs and assistance options;*** Develop baseline of existing fencing and farm plans; 1-2 new farm plans and fencing per year	1-2 new farm plans and fencing per year, or as opportunities arise	1-2 new farm plans and fencing per year, or as opportunities arise	Continue implementation as appropriate	All livestock fenced out of steams and alternative off-stream stock watering sites implemented, when/where feasible	$3120 per farm plan (average of 60 hours x $25/hour) Fencing - $3.15 per foot; Charger - $315; Cattle Guards - $3675 each
				Assist landowners to improve septic systems if need is documented	9.5 (8), p. 9-19	***Host public workshops re: sanitation e.g. septic location / upgrades***	Identify opportunities and implement as appropriate			All septic systems upgraded if needed and in compliance with current standards	

Table 9. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Lower Entiat Assessment Unit (continued).

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Reference	Actions / Strategies					Cost
						Year 1 - 3	Year 3-6	Year 6-10	After Year 10	Long-Term	
Lower Entiat Assessment Unit	Flows / Hydrology	Water Quantity / Low Flow	Water Quantity Restoration	Continue Knapp-Wham and Hanan Detwiler irrigation ditch consolidation effort	9.3 (4), p. 9-7; 9.3 (5), p. 9-8	Design and permit system; perform water rights administration; secure funding	Construction Complete	Potential formation of KW-HD irrigation district under Chapter 87.03 RCW	Ditches consolidated and potentially a new irrigation district	KW and HD systems consolidated for optimal conveyance (and distribution) efficiency	$1,000,000
				Continue exploring options to extend Entiat Irrigation District line upstream	9.3 (4), p. 9-7	Complete PUD and EID investigation / dialogue, and proceed accordingly				Ideal: EID serving new upstream users with Columbia River water to minimize impacts to lower river flows	$1,000,000
				Pursue other water conveyance efficiency and diversion improvements	9.3 (4), p. 9-7	Identify opportunities and implement as appropriate				All other ditches piped if feasible, and diversion structures at optimum efficiency	unknown
				Improve on-farm irrigation application efficiency, scheduling, and general water conservation.	9.3 (4), p. 9-7	***Host sessions on IWM, water-wise landscaping & assistance options;*** Develop baseline of existing efficiencies and locations; 1-2 system upgrades/yr	1-2 system upgrades per year	1-2 system upgrades per year	Continue implementation as appropriate	All on-farm irrigation systems and practices are as efficient as possible.	$1500-$2000 per acre for full conversion to micro-system (estimate includes screens, delivery lines, valves, etc.)
				Provide technical and cost-share assistance for water metering and reporting	9.3 (2), p. 9-6	***Host workshop about metering and available help;*** Install 1-3 meters per year	1-3 meters installed per year	1-3 meters installed per year	Continue implementation as appropriate	All surface water diversions, especially ≥1cfs, are metered and reporting	$500-$2000 for meter device; $750-$3000 including installation / technical assistance
				Continue conversion of surface water diversions to ground water/well withdrawals, when feasible	9.3 (4), p. 9-7	1-2 well conversions per year	1-2 well conversions per year	1-2 well conversions per year	1-2 well conversions per year	All surface water pumps converted to wells when/where feasible	$30,000 per well (estimate includes well drilling/casing, pump and piping for delivery, project admin/management)
	Habitat Quality	Habitat Diversity / Key Habitat	Instream Structures	Implement EDT Alternative 5, focusing on pool forming structures	9.4 (1), pp. 9-10 and 9-11; 9.4 (6), p. 9-13	1 - 3 structures per year, or as opportunities arise	3 - 5 structures per year, or as opportunities arise	3 - 5 structures per year, or as opportunities arise	3 - 5 structures per year, or as opportunities arise	End: Up to 65 rock and/or wood structures as identified in WRIA 46 Plan and supplemental analyses	$2,275,000 at $35,000/ structure (assumes NRCS/CD engineering, mgmt, rates, and includes construction)
			LWD Restoration								
			Floodplain Restoration	Implement Ecosystem Diagnosis and Treatment (EDT) Alternative 5 side-channel options	9.4 (1), pp. 9-10 and 9-11, 9.4 (6), p. 9-13	1-2 reconnection projects (Phases II and III of B2B; PUD Ditch)	1-2 reconnect projects (lower river channel)	1-2 reconnection projects	Complete	End: All potential (possibly 5) off-channel opportunities reconnected.	$1,500,000
			Side-Channel Reconnection								

Table 9. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Lower Entiat Assessment Unit (continued).

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Reference	Actions / Strategies					Cost
						Year 1 - 3	Year 3-6	Year 6-10	After Year 10	Long-Term	
Lower Entiat Assessment Unit		Habitat Diversity / Riparian	Riparian Restoration	Implement riparian planting projects with willing landowners	9.4 (2), pp. 9-11 and 9-12	***Host workshops about the function / benefits of riparian vegetation and assistance programs;*** Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	End: ~30,000 lineal feet as identified in WRIA 46 Plan and supplemental analyses (SNTEMP, ground truthing, etc.)	$300,000 (Cost assumes mix of young and mature trees, technical planting assistance, fencing/mulch, etc.)
			Riparian Protection	Work with willing landowners to protect larger, undisturbed riparian areas by first pursuing conservation easement, lease, and options other than outright property acquisition	9.4 (1), p. 9-11; 9.4 (2), p. 9-12	***Promote IRIS pilot habitat farming initiative, easement and habitat leasing programs, development right transfer options, etc.***	Identify opportunities and implement as appropriate	Identify opportunities and implement as appropriate	Identify opportunities and implement as appropriate	Larger undisturbed riparian areas are preserved in a manner that does not adversely impact community tax base	unknown
			Obstruction Restoration	Screen and/or upgrade existing screens on pumps/diversion intakes	9.4 (4), p. 9-13	1 screening per year	1 screening per year	1 screening per year	1 screening per year	All diversions/pumps screened appropriately.	Work with Steve to get cost estimates

Table 10. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Middle Entiat Assessment Unit

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Reference	Actions / Strategies					
						Year 1 - 3	Year 3-6	Year 6-10	After Year 10	Long-Term	Cost
Middle Entiat Assessment Unit	Watershed Condition		Road Management	50-60 miles USFS road decommissioning	9.5 (10), p. 9-15	Initiate	Complete				$600,000
				30 miles heavy maintenance - reconstruction on USFS roads	9.5 (10), p. 9-15	Initiate	Complete				$600,000
		Ecosystem function	Water Quality / Quantity Restoration (related to wetlands)	Maintain existing wetlands or enhance few remaining wetlands and their function	9.4 (3), p. 9-12; 9.3 (7), p. 9-8	***Provide information on wetland functions and assistance options;*** Update NWI GIS data to reflect known, field checked wetlands	Continue mapping updates and implement wetlands projects as appropriate			To the extent possible, wetlands are delineated, mapped, rated and protected/enhanced.	unknown
	Water Quality	Nutrient Limitations	Nutrient Restoration	Continue hatchery carcass out planting and/or use of nutrient analogs		Initiate Analog Pilot Program	Continue program	Continue program	Continue implementation as appropriate	Increased appropriate nutrient productivity	unknown
		Water Temperature Extremes (summer highs and winter lows)	Water Quality Restoration	Implement actions identified in SNTEMP study, EDT report, and Entiat River Inventory and Analysis to help moderate temperatures	9.5 (2), p. 9-17	See Habitat Diversity / Key Habitat and Riparian				Site-specific shade increased by or up to 50%; channel width-to-depth ratios decreased	$1,000,000
		Sustain Properly Functioning Condition (Prevent dissolved oxygen, nutrients / pH and toxics from becoming limiting factors)	Water Quality Protection	Continue to assist landowners with farm plan development, including livestock BMPs and nutrient management	9.6 (2), p. 9-20	***Host info sessions on BMPs and assistance options;*** Develop baseline of existing fencing and farm plans; 1-2 new farm plans and fencing / other practices per year	1-2 new farm plans and fencing / other practices per year	1-2 new farm plans and fencing / other practices per year	Continue implementation as appropriate	All livestock fenced out of steams and alternative off-stream stock watering sites implemented, when/where feasible	$3120 per farm plan (average of 60 hours x $25/hour) Fencing - $3.15 per foot; Charger - $315; Cattle Guards - $3675 each
				Assist landowners to improve septic systems if need is documented	9.5 (8), p. 9-19	***Host public workshops re: sanitation issues, e.g. septic location and upgrades***	Identify opportunities and implement as appropriate			All septic systems upgraded as needed and in compliance with current standards	unknown

Table 10. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Middle Entiat Assessment Unit (continued).

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Reference	Actions / Strategies					Cost
						Year 1 - 3	Year 3-6	Year 6-10	After Year 10	Long-Term	
Middle Entiat Assessment Unit		Habitat Diversity / Riparian	LWD Restoration	Fully implement Ecosystem Diagnosis and Treatment (EDT) Alternative 5 - LWD treatments	9.4 (1), pp. 9-10 and 9-11	Implement LWD installation at 2-3 priority Stillwater sites that were identified in 2005	3 - 5 structures per year	3 - 5 structures per year	3 - 5 structures per year	End: Up to 10 LWD restoration projects as identified in WRIA 46 Plan and supplemental analyses	$350,000 at $35,000 per structure (Cost assumes NRCS/CD rates for admin, engineering, permitting, mgmt, and includes construction)
			Riparian Restoration	Implement riparian planting projects with willing landowners	9.4 (2), pp. 9-11 and 9-12	Host workshops about the function / benefits of riparian vegetation and assistance programs; Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 - 1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 - 1000 feet per year or 0.25 - 0.5 acres per year)	End: ~10,000 lineal feet as identified in WRIA 46 Plan and supplemental analyses (SNTEMP, ground truthing, etc.)	$100,000 (Cost assumes mix of young and mature trees, technical planting assistance, fencing/mulch, etc.)
			Riparian Protection	Willing landowners protect larger, undisturbed riparian areas by first pursuing conservation easement, lease, and options other than outright property acquisition	9.4 (1), p. 9-11; 9.4 (2), p. 9-12	Promote IRIS pilot habitat farming initiative, easement and habitat leasing programs, development right transfer options, etc. Identify opportunities and implement as appropriate	Identify opportunities and implement as appropriate	Identify opportunities and implement as appropriate	Identify opportunities and implement as appropriate	Larger undisturbed riparian areas are preserved in a manner that does not adversely impact community tax base	unknown
	Flows / Hydrology	Sustain Properly Functioning Condition (and enhance flows when possible)	Water Quantity Restoration	Pursue water conveyance efficiency and diversion improvements	9.3 (4), p. 9-7	Identify opportunities and implement as appropriate				All ditches piped if feasible, and diversion structures at optimum design/efficiency	unknown
				Improve on-farm irrigation application efficiency, scheduling, and general water conservation.	9.3 (4), p. 9-7	***Host sessions on IWM, water-wise landscaping & assistance options;*** Develop baseline of existing efficiencies and locations; 1-2 system upgrades per year	1-2 system upgrades per year	1-2 system upgrades per year	Continue implementation as appropriate	All on-farm irrigation systems and practices are as efficient as possible.	$600,0000 at $1500-$2000 per acre for full conversion to micro-system (estimate includes screens, delivery lines, valves, etc.)
				Continue conversion of surface water diversions to ground water/well withdrawals, when feasible	9.3 (4), p. 9-7	1-2 well conversions per year	1-2 well conversions per year	1-2 well conversions per year	1-2 well conversions per year	All surface water pumps converted to wells when/where feasible	$600,000 at $30,000 per well (estimate includes well drilling/casing, pump and piping for delivery, project admin/management)
	Habitat Access	Obstructions (Stormy Creek)	Obstruction Restoration	Repair 2 Stormy Creek culverts that present fish passage problems	9.4 (4), p. 9-13	Initiate discussion with landowner/USFS to replace 2 culverts; collect data	Design, Permit and complete 2 culverts.			Passage at 2 Stormy Creek culverts u.s. of County bridge	$150,000

Table 11. Recommended WRIA 46 strategies and actions, timelines and milestones, and estimated costs - Upper Entiat and Mad Assessment Units

General Location	Monitoring Parameter	Limiting Factor	Project Type	Specific Action	WRIA 46 Plan Recommendations and Page Reference	Year 1 - 3 Actions / Strategies					Cost
						Year 1-3	Year 3-6	Year 6-10	After Year 10	Long-Term	
Upper Entiat	Ecologic		Brook Trout - Bull Trout Evaluation	Evaluate presence/absence of bull trout above Entiat Falls		Continue monitoring					unknown
Mad River	Watershed Condition		Road Management	4 miles USFS road decommissioning	9.5 (10), p. 9-15	Completed					$40,000
				12 miles heavy maintenance reconstruction		completed					$240,000
				Estimate 40 miles decommission/heavy maintenance / reconstruction in Tillicum watershed			Initiated	Completed			$400,000
				Improve County road maintenance along lower Mad River road	9.5 (10), p. 9-15	Address issue of road crew side-casting of materials	Continue program	Continue program	Continue implementation as appropriate	Side-casting of materials resulting from lower Mad River road maintenance is eliminated	unknown
	In-Channel Condition	Habitat Diversity / Key Habitat	Instream Structures	Install rock gravel catchers to promote gravel recruitment					1-2 structures per year	5-10 structures in 20 years	$100,000

9.0 APPROVALS, PERMITS AND ADMINISTRATIVE TOOLS

9.1 Administrative Approvals [RCW 90.82.043 (3)]

The WRIA 46 Management Plan was unanimously approved by the EWPU on May 17, 2004, and formally approved by the Chelan County Commissioners on September 13, 2004. During the July 7, 2004 EWPU meeting, it was agreed that the same Planning Unit structure (Conservation District as Lead Agency; Entiat Irrigation District, City of Entiat, Chelan County as Initiating Governments) should be maintained for implementation of the WRIA 46 plan. These administrative approvals were required to define Phase 4 - implementation roles and receive funding and authorization under Chapter 90.82 RCW for development of a detailed implementation plan for WRIA 46.

Although the Phase 4 legislation is silent, Ecology determined that administrative approval of this document by the Planning Unit will be required in order for the Conservation District to obtain additional Phase 4 implementation grant funds under Chapter 90.82. Subsequent administrative approval by the County is not required, but is desired by WDOE and anticipated to occur as part of the overall Entiat DIP approval process.

9.2 Agreements

9.2.1 Memoranda of Understanding/Memoranda of Agreement

A Memorandum of Understanding (MOU) is a written agreement between parties that defines expectations and enables parties to carry out their separate activities in a coordinated and mutually beneficial manner; however, the actions of one party do not depend upon the actions of the other party. It is used when there will not be an exchange of funding or resources but there is a need to formally document the relationship.

No MOUs are required for implementation of WRIA 46 Plan actions; however, the Conservation District has used MOUs with various partner agencies in the past, as necessary, to clarify partner roles. The District may pursue development of MOUs with Chelan County, Ecology, and other entities during implementation in order to assure successful long-term tracking of the Entiat water resources rule and other activities outlined in the implementation plan for Chapter 173-546 (Appendix D).

A Memorandum of Agreement is similar to an MOU, but defines general areas of conditional agreement between parties such that what one party does depends on what the other does. A MOA was developed between USFS Region 6 and the Department of Ecology to prevent duplication of effort and provide coordination to meet Clean Water Act requirements and the goals of both agencies. This MOA provides “reasonable assurance” to the EWPU and other stakeholders that the USFS will continue its efforts to address water quality issues on lands it manages within the Entiat WRIA (and Region 6) by affirming the USFS’ role as lead for these activities.

Revisions to existing administrative memoranda may occur or new memoranda may be developed during the Entiat implementation process, as necessary, to define support roles and commitments and ensure coordinated implementation of actions within the Entiat subbasin.

9.2.2

Interlocal Agreements

Like memoranda, interlocal agreements are not required to implement actions in this document. However, such agreements are used by local government entities to cooperate with one another on implementation tasks by defining scope and budget for activities, and enabling transfer of funds among entities if shared effort is required to implement actions.

Chelan County recently developed a blanket interlocal agreement for use by the County and the Conservation District to facilitate collaboration on projects, tasking and funds sharing as necessary for implementation of WRIA 46 plan actions and other efforts that involve County and District cooperation.

9.2.3 Joint Funding Agreements

The Conservation District and the USGS established a joint funding agreement to define the cost-sharing through which the three (3) USGS gages in the Entiat subbasin are funded. The joint funding agreement enumerates the operation and maintenance costs, on an annual basis, that the District is required to provide the USGS at the end of each water year to support of gage operation.

9.3 Wyden Amendment

In 1998, U.S. Senator Ron Wyden added an amendment to a Senate appropriations bill allowing Forest Service money to be spent on non-federal lands as long as the projects benefit the fish, wildlife, and other resources on National Forest lands within an affected watershed (Public Law 105-277, Section 323). This law allows the USFS to partner with other entities to implement projects that benefit resources on both public and private lands. The project's goals must be to restore and enhance watersheds. Benefits can include:

- Improving, maintaining, or protecting ecosystem conditions through collaborative administration and/or implementation of projects
- Improving collaborative efforts across all ownerships, including efforts on lands that are not adjacent to Forest Service lands
- Increasing operational effectiveness and efficiency through the coordination of efforts, services, and products
- In-stream restoration work and the clearing of fire-prone brush adjacent to National Forest lands.

Chelan County and the Conservation District have utilized the Wyden Amendment to enable support from the USFS Wenatchee National Forest on watershed projects such as the Stormy Creek culvert replacement, which was performed to provide access for ESA listed anadromous fish species from the mainstem Entiat River into Stormy Creek. The Wyden Amendment will likely be utilized to facilitate implementation of additional projects within the Entiat subbasin, e.g. fuels reduction projects resulting from the recently initiated Entiat Community Wildfire Protection Planning process.

9.4 Ordinances, Resolutions and Rules

No ordinances are required for approval of this document; however, the Chelan County Commissioners may opt to prepare a resolution (contingent upon their approval of this document), as they did after formal approval of the Entiat WRIA 46 Management Plan.

Instream flows for the Entiat and Mad Rivers, and water resource management strategies designed to provide water for future uses through the year 20025 were formally codified as Chapter 173-546, Water Resources Management Program - Entiat River Basin on August 3, 2005. Refer to Appendix C for WRIA 46 rule language. The EWPU may opt to explore rule making for codification of its "Planning Unit" instream flows at a future date.

9.5 Permit, ESA Consultation and SEPA/NEPA Requirements

Numerous local, state, and federal entities are responsible for the development, adoption, implementation and enforcement of laws, management programs and policies designed to avoid or minimize impacts to the environment associated with land use activities and direct how actions must be implemented. Examples include:

- Comprehensive Plans (land use, water, wastewater, storm water, solid waste, etc.)
- Implementing Regulations (zoning, critical areas, shorelines, development standards, etc.)
- Permitting Processes (conditional use, substantial development, building, variance, exemption, etc…)
- Code Enforcement/Compliance
- Environmental Review (SEPA and NEPA)

As such, typical actions occurring in the Entiat watershed that require permits or other types of administrative authorization include (but are not limited to):

- Residential and commercial site preparation and construction/land development;
- Commercial agricultural and business ventures, including home-based commerce;
- Timber or other resource harvest on public lands;
- Consumptive water use; and
- Land use activities that may potentially affect wetlands, shoreline areas, wildlife habitats, etc.

Table 12 highlights some of the permits that will likely be required for implementation of restoration projects in the Entiat subbasin, by which entity the permit is issued, and what actions necessitate (trigger) a permit requirement. This list is by no list exhaustive; permit requirements are dependent upon the type of activity that is proposed for implementation.

The Entiat subbasin supports ESA listed fish, wildlife and plant species. If a project is authorized, funded or carried out by a Federal agency and the agency determines that the proposed project may affect ESA listed species or critical habitat, consultation with NOAA Fisheries and the US Fish and Wildlife Service under Section 7 of the ESA is required. The federal agency that has the greatest investment in or nexus to the project via funding, land ownership, etc., in conjunction with the project proponent may be the lead for consultation.

ESA consultation requires that, in addition to standard permitting materials, a Biologic Assessment (BA) that details potential project impacts to listed species and their habitat be prepared and submitted. The BA will then be evaluated by NOAA Fisheries and USFWS, these federal agencies will then issue a letter of concurrence for actions that are not likely to affect listed species or their associated critical habitat.

Table 12. Typical permits required for implementation.

Permit	Issuing Agency	Action/Permit Trigger
Hydraulic Project Approval	Department of Fish and Wildlife (under 77.55 RCW)	Construction or other work, that: will use, divert, obstruct, or change the natural flow or bed of any water of the state. This includes bed reconfiguration, all construction or other work waterward under and over the ordinary high water line, including dry channels, and may include projects landward of the ordinary high water line (e.g., activities outside the ordinary high water line that will directly impact fish life and habitat - falling trees into streams or lakes, diking, etc.)
Shoreline Substantial Development, Conditional Use, Variance Permit, or Exemption.	Chelan County Building and Planning Dept. (under the Shoreline Management Act, 90.58 RCW)	Work or activity in the 100-year floodplain, or within 200 feet of the ordinary high water mark of Shorelines of the State; and which includes any one of the following: dumping; drilling; dredging; filling; placement or alteration of structures (whether temporary or permanent); or any activity which substantially interferes with normal public use of the waters.
Floodplain Management Permits and/or Critical Areas Ordinances	Chelan County Building and Planning Dept.	Work in frequently flooded areas, geologically unstable areas, wildlife habitats, aquifer recharge areas, and wetlands.
Section 401 Water Quality Certification	Department of Ecology - Central Regional Office, SEA Program (under 33 USC § 1341 of the Clean Water Act)	Needed when a federal approval is required for a project, including the following: Corps of Engineers 404 Permit --Send to Ecology's Federal Permits Unit in the Regional Office.
Water Right Permit	Department of Ecology - Central Regional Office	Any water use that does not meet the provisions for a permit-exempt well (up to 5000 gallons per day for residential, stock watering, industrial use and irrigation of up to ½ acre of non-commercial garden or lawn).
Section 404 Permit	US Army Corps of Engineers (under 33 USC § 1344 of the Clean Water Act)	Placement of dredged or fill material waterward of the ordinary high water mark, including wetlands; mechanized land clearing and sidecasting in waters of the United States, including wetlands[2]; or Endangered Species Act (ESA) Consultation.

If a project is authorized, funded or carried out by a federal agency and the agency determines that the proposed project may affect ESA listed species or critical habitat, consultation with NMFS and the US Fish and Wildlife Service under Section 7 of the ESA is required. The federal agency that has the greatest investment in or nexus to the project via funding, land ownership, etc., in conjunction with the project proponent may be the lead for ESA consultation.

[2] Wetlands that are determined to be isolated by the Army Corps of Engineers are no longer regulated under Section 404 of the Clean Water Act. These wetlands are regulated by the Department of Ecology under the state Clean Water Act, RCW 90.48.

Consultation requires that, in addition to standard permitting materials, a Biologic Assessment (BA) that details potential project impacts to listed species and their habitat be prepared and submitted. The BA will then be evaluated by NMFS and USFWS, these federal agencies will then issue a letter of concurrence for actions that are not likely to affect listed species or their associated critical habitat. If the proposed action is determined to affect a listed species or their associated critical habitat then NMFS and USFWS will issue a Biological Opinion (BO) and associated Incidental Take Permit. The project proponent, in conjunction with the lead federal agency are responsible to implementing the terms and conditions of the Incidental Take Permit.

Larger projects and programmatic actions may also require review for compliance with the State Environmental Policy Act (SEPA) or National Environmental Policy Act (NEPA), and preparation of associated documents such as a Determination of Non-Significance, Categorical Exclusion, or cultural resources assessment.

Currently, permitting and ESA consultation can take up to six months due to the complexity of the process and other factors such as permit agency staffing limitations. Existing and future permitting timelines will affect overall project implementation rates. The cost of permitting and ESA consultation may result in higher project implementation costs for some types of restoration projects.

10.0 MONITORING

Monitoring is performed to gather data for the evaluation of progress, projects, environmental trends, species dynamics, etc., using specific protocols. It may also be used to validate and refine scientific assumptions. During evaluation, data are analyzed and interpreted to determine whether objectives are being met and actions are causing desired effects. The following table (Hillman 2005) describes the most common types of monitoring. Those with an asterisk are currently underway within the Entiat subbasin.

Table 13. Common types of monitoring and Entiat activities.

Monitoring Type	Description	Intended Use	Tools/Techniques
Status / Baseline *	Data are collected to characterize existing or undisturbed conditions, and establish a dataset against which future data may be compared.	Performed to capture temporal and spatial variability in the parameter of interest.	Targeted status and trend monitoring Specific sites or fixed reaches are established and revisited annually for data collection. **Probabilistic status and trend monitoring** Sites are randomly selected to capture ecosystem or landscape-level data. Some sites are revisited annually; others are placed on a rotating cycle.
Trend *	Measurements are taken at regular time intervals in order to evaluate the long-term trend in a particular parameter, e.g. water temperature.	Usually used to describe changes in the parameter(s) of interest over time, rather than to evaluate the effects of management practices.	
Effectiveness *	Restoration activities are evaluated based on whether they achieved the desired effect, goal, or predicted outcome. Project monitoring addresses the effectiveness of a particular project.	Used to measure "success" against reference area conditions, baseline conditions, or desired future conditions.	To the extent possible, use of a Before-After-Control-Impact (BACI) design with stratified random sampling, as described in the Upper Columbia Monitoring Strategy (Hillman 2004).

Table 13. Common types of monitoring and Entiat activities (continued).

Monitoring Type	Description	Intended Use	Tools/Techniques
Validation	Data are used to validate or refine scientific understanding.	Research oriented monitoring used to verify monitoring and model assumptions, such as EDT results.	Additional modeling, e.g. EDT, SNTEMP, using new or refined data inputs and scenarios.
Compliance *	Typically, status and trend data are compared against numeric or descriptive regulatory standards.	Determine whether specified criteria are being met.	Comparisons against state water quality standards, fish passage criteria , etc.
Implementation *	Information such as programmatic timelines and milestones, number and type of projects implemented, is assembled to assess whether activities were carried out as planned. No parameter measurements are required.	Generally performed as an administrative review to track progress. It does not link restoration activities to physical, chemical or biological responses.	Site inspections; photographs; field notes on quantity, location, quality, quantity, and area affected by the action (Guides: draft "Project Monitoring: A guide for sponsors in the Upper Columbia Basin" (Hillman 2005) and "Upper Columbia Biologic Monitoring Strategy" (Hillman 2004).

10.1 Status and Trend Monitoring

The Entiat has traditionally been a "data rich" subbasin, due in large part to the long-term status and trend monitoring programs established and supported by the USGS and USFS. Additional ongoing monitoring support in the Entiat subbasin is provided by the USFWS, Ecology and other EWPU partner agencies. Most federal and state partner monitoring agencies are experiencing annual budget cuts, bringing into question the sustainability of certain data collection activities within the Entiat subbasin. EWPU technical subcommittee and UCSRB RTT members are in the process of developing an overall monitoring strategy for the Entiat subbasin in order to highlight data collection priorities and help assure that long-term monitoring is sustained. Refer to Table X for a summary of ongoing monitoring activities, responsible agencies, and annual cost estimates for data collection, analyses, and reporting.

10.2 Implementation Monitoring

A number of "early action" habitat restoration activities are underway or have been recently completed within the Entiat subbasin. Level 1 project monitoring, e.g. riparian planting photo points and mortality assessments, must be performed after project implementation in order to document project successes and difficulties, evaluate the rate of implementation and extent of treatments within the subbasin, and assess whether overall goals and timelines are being met. Implementation monitoring is a key component of the adaptive management process.

The EWPU is developing specific methods and metrics that will be utilized to track implementation of all WRIA 46 Plan activities. Planning Unit members are working with members of the UCSRB RTT and recovery planning staff to develop an overall monitoring framework for the Entiat subbasin, including an implementation monitoring component designed to track the number and type of WRIA 46 activities and projects that are implemented annually.

10.3 Effectiveness Monitoring

Effectiveness monitoring – the study of how restoration actions affect fish populations and habitat conditions – has been identified by state and federal funding agencies as critical to the development, adaptive management, and accountability of publicly-funded restoration programs. In 2003 members of the UCSRB RTT and NMFS secured preliminary funding to initiate an effectiveness monitoring study in the Entiat subbasin. The Entiat Effectiveness Monitoring Study will measure the extent to which the Bridge-to-Bridge Habitat Reach Restoration Project and other activities planned in the lower Entiat Assessment Unit affect (a) fish habitat, (b) fish habitat utilization, and (c) the productivity of salmonid fishes in the Entiat Subbasin. This pilot initiative will test aspects of the Monitoring Strategy for the Upper Columbia Basin (Hillman 2004) that pertain to effectiveness monitoring. Surveys of fish habitat and fish habitat utilization supported by this Study will be synthesized with separately-funded, yet compatible, agency monitoring programs to include all of the indicators specified for study in Hillman (2004). Coordination with Entiat landowners and the EWPU was built into the study design. Refer to Appendix H for more information and a detailed summary of the pilot Entiat Effectiveness Monitoring Study.

10.4 Compliance Monitoring

Some WRIA 46 plan actions were recommended specifically to help obtain regulatory compliance with Clean Water Act and state water quality standards, and track actions related to the newly codified Entiat River Basin Water Resources Management Program, Chapter 173-546 WAC. This section outlines proposed methods and metrics for tracking implementation progress as it relates to regulatory compliance and achieving specific restoration goals.

10.4.1 Water Quality

Waters that do not meet Washington's water quality standards are included on the state 303(d) list of impaired waters. The Entiat River is on the 2004 303(d) list for temperature and pH exceedences. When water bodies are placed on the 303(d) list, the state is required to prioritize them for preparation of Total Maximum Daily Load (TMDL) water clean up plans. Development of plans to "clean-up" 303(d) listed waters is required in accordance with the Clean Water Act

Attaining compliance with state water quality standards is particularly important to the EWPU from both a water quality and stream habitat perspective, as water quality affects not only human health but also aquatic species and their habitats. Meeting water quality standards for temperature and pH, either through implementing actions to improve conditions or documenting that exceedences are due to natural causes, will result in regulatory relief under the Clean Water Act and eliminate the need for preparation of water clean up plan. Although the Entiat is not currently a high priority for preparation of a TMDL for temperature or pH, the water quality improvement actions and implementation strategy outlined in this plan should provide a sufficient framework for tracking and assuring water quality improvements similar to what would be included in a TMDL action plan.

Table 14. Compliance monitoring parameters, targets and metrics.

Monitoring Parameter	Target Class A criteria (RM 0.0-26)	Target Class AA criteria (above RM 26)	Metric	2004 Range (USFS temp data; WDOE pH)
Temp.	Freshwater temperature ≤ 18°Celsius (64.4° F) due to human activities	Freshwater temperature ≤ 16.0°C (60.8° F; Forest Plan standard is 61° F) due to human activities.	7-day average of the daily maximum (<58°F) in any one year[3] OR instantaneous grab sample in 3 different years.	Class A -1829 stream days, 409 days >64.4 ° F; Class AA:945 stream days; 117 > 61 °F
pH	Freshwater within range of 6.5 to 8.5, with human-caused variation within a range of < 0.5 units.	Freshwater within range of 6.5 to 8.5, with human-caused variation within a range of < 0.2 units.	Exceedence of the standard is indicated for 10%[4] of the water in the segment.	Class A: 12 measurements (1 per month). 3 had pH over 8.5; high = 8.87

The priority action identified by the EWPU to address summer high temperatures is increasing site specific shade throughout the Entiat watershed via riparian restoration. Reductions in width-to-depth ratios in the lower 10 miles of the river will also help improve temperature conditions, and some cooling of stream water during critical periods may also be accomplished by increasing summer instream flows levels in the lower mainstem, when feasible. The Entiat SNTEMP model identified that 50% increases[5] in riparian shade consistently produced the greatest reduction in stream temperatures per unit percent change than either increases in streamflow or decreases in channel width (Hendrick and Monahan 2003). The SNTEMP model also showed that in all likelihood, the Entiat will never achieve full compliance with water quality standards for temperature due to the natural warming that occurs in some portions of the river. Rather, the result will be a decrease in the number of exceedences that occur.

In November 2005, the USEPA agreed that Ecology's proposal that the Entiat River receive a Category 4(b) listing for temperature (Impaired, but has a pollution control plan) was justified based on the strategic actions to address temperature recommended in the WRIA 46 plan. The EWPU has a high degree of confidence that the actions it has recommended will help meet water quality goals; however, monitoring and tracking progress is necessary to assure that progress is made as expected in a reasonable amount of time.

The goal of the EWPU is to provide as much "reasonable assurance" to Ecology and the EPA as possible that progress towards achieving state water quality standards can be made by utilizing the framework contained in this document. Table 15 provides examples of methods that may be used to track progress in the Entiat related to water quality improvement.

[3] The 7-DADMax is the arithmetic average of seven consecutive measures of daily maximums. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum level with the daily maximum levels of the three days prior and the three days after that date.

[4] The true exceedence percentage will be determined using a binomial distribution method with a 90% confidence interval. A segment will be placed on the 303(d) list if the data show a true exceedence percentage in the waterbody segment of 10% or greater. This method requires somewhat more than 10% of the water samples themselves to be exceedences. The precise number of exceedences required depends on the sample size.

[5] The target is to increase site specific shade/canopy cover by 50% (e.g. 10% initial + 50% improvement = 60% final canopy cover) throughout the Entiat watershed. Because current riparian shade is already estimated at 20-30% between river miles 18-34, the goal in this area is to increase conditions up to the point of 50% canopy cover.

The USFS performs an annual review and evaluation of temperature data for water quality compliance purposes. This existing compliance monitoring is expected to continue. In addition, the EPWU is currently working with members of the Upper Columbia RTT to identify appropriate monitoring protocols and metrics that will be used to help measure progress.

Table 15. Possible methods by which to track actions ties to attaining compliance.

Description	Measurement Method	Timeline
Riparian restoration		
Plant new native vegetation along stream banks using mix of deciduous and coniferous shrub and tree species.	Number of plants, size and species utilized; total lineal feet/width and acreage of streamside (and upland?) revegetated.	Ongoing, annual
Monitor plant growth, health and survivorship.	Compare plant percent survivorship, size data, and photos to baseline.	Ongoing, annual
Increased streamside shading	Compare streamside effective shade to baseline via aerial and site photos taken every xx years; GIS mapping.	Re-evaluate every five years
Road improvements	Miles/percentage of roads or trails improved, relocated out of riparian areas, or decommissioned.	Annual Review
Reduced stream temperatures	Compare longitudinal temperature profile to baseline	Annual review
Reduced pH levels	Compare new pH data collected via monthly grab samples to baseline and standards.	Annual review

10.4.2 Water Quantity and Instream Flows

Chapter 173-546 WAC (Appendix C) established instream flows for the Entiat and Mad Rivers, a maximum future allocation, and volumes of water available for appropriation from a 5 cfs Reserve designed to meet future domestic, commercial agricultural, and business/light industrial water needs through the year 2025.

Permit staff at the Central Regional Office will use both Chapter 173-546 WAC and the Entiat WRIA 46 Management Plan as the rule and framework, respectively, for future water rights decision-making in the subbasin. Due to the complex nature of the Entiat Rule, a number of mechanisms have been established to track compliance with its instream flow levels, reserve water access stipulations, and other components of the rule. Refer to Appendix D for the implementation plan for the Entiat water resources management program. The Conservation District and County are in the process of implementing a pilot permit exempt well tracking framework (Appendix G) to capture data on new exempt wells that result from new construction in the Entiat WRIA.

10.5 Monitoring Recommendations and Priorities

Table 16 provides a summary of WRIA 46 monitoring recommendations, priority and rationale. Table 17 summarizes many of the monitoring activities that are ongoing within the Entiat subbasin, costs associated with these efforts, and funding caveats.

Table 16. WRIA 46 Plan monitoring recommendations and priorities.

Monitoring Type	Specific Action	WRIA 46 Plan Recommendation & Page Reference	EWPU Priority (and Rationale)	Current Contacts
Instream Flows Long-term Targeted Status and Trend Compliance	Continue monitoring instream flows at (3) USGS streamflow gages (Keystone, Stormy, and Mad at Mill Camp Continue monitoring at WDOE streamflow gages.	9.3.1, p. 9-9	**High** (Ties to Chapter 173-546 WAC, water quality)	3 USGS gages: USGS CCCD --- WDOE CCCD
Water Quantity Water Resource Programmatic (Chapter 173-546) Compliance	Track exempt well development annually using WDOE data and proposed water tracking mechanism	9.3.1, p. 9-9	**High** (Tied to rule, water tracking proposal)	WDOE CCCD
	Establish tracking system with County for wells associated with new construction	9.3 (2), p. 9-6	**High** (Tied to rule, water tracking proposal)	Chelan Co CCCD
	Track new water right applications, permits, certificates, claims and associated geographic and water volumes annually in coordination with WDOE.	9.3.1, p. 9-9	**High** (Tied to rule implementation and reserve tracking)	WDOE CCCD
Water Quantity Status and Trend	Continue monitoring population growth on an annual basis using the State of Washington (OFM estimates) and on a decadal basis using federal census data	9.3.1, p. 9-9	Medium (Tie to Rule but not immediate need; long-term)	Chelan Co CCCD
	Reassess land use every 5 years	9.3.1, p. 9-10	Medium (Not immediate need; long-term)	Chelan Co
	Reassess water use every 5 years	9.3.1, p. 9-10	Medium (Not immediate need; long-term)	CCCD
Water Quantity Validation	Encourage willing to meter single household permit exempt wells to refine in-house domestic water use estimates	9.3 (2), p. 9-6	Medium (Not immediate need; long-term)	
Habitat Probabilistic Status and Trend	Continue probabilistic habitat monitoring consistent with Upper Columbia Salmon Recovery Board (UCSRB) Regional Technical Team (RTT) "Monitoring Strategy for the Upper Columbia Basin" (Hillman 2004, *draft*) or revised guidance	9.2, p. 9-3; 9.4 (7), p. 9-14	**High** (First panel of sites (10) monitored in 2004-2005)	TerrAqua, Inc. and UC Regional Technical Team
Fisheries Status and Trend	Continue anadromous fish distribution, abundance, and redd surveys in the Entiat River watershed;	9.4 (7), p. 9-14	**High** (Sustain long-term record)	USFS USFWS
	Continue monitoring of salmonid outmigrants via smolt traps, and potentially expand monitoring	9.4 (7), p. 9-14	**High** (Ongoing, Tied to salmon recovery / fisheries mgmt)	USFWS

Table 16. WRIA 46 Plan monitoring recommendations and priorities (continued).

Monitoring Type	Specific Action	WRIA 46 Plan Recommendation & Page Reference	EWPU Priority (and Rationale)	Current Contacts
Effectiveness Monitoring	Continue cooperative physical and biologic monitoring of instream demo structures.	9.4 (1), p. 9-11; 9.4 (12)	**High** (Sustain effort - monitoring initiated in 2001)	NRCS/CCCD, USFWS
	Continue Entiat effectiveness monitoring study and add new restoration project sites to monitoring scope, as feasible.	9.4 (1), p. 9-11; 9.4 (12), p. 9-16	**High** (Initiated in 2005 as part of BPA ISEMP effort)	TerrAqua, Inc. and UCSRB Regional Technical Team
	Monitor the effects of additional riparian vegetation and in-channel projects on winter water temperatures and anchor ice formation.	9.4 (2), p. 9-12; 9.4 (6), p. 9-13	Medium (Not immediate need; long-term)	CCCD
Implementation Monitoring	Track / monitor projects as they are implemented.	n/a	**High** (EWPU currently working to develop)	EWPU RTT
Water Quality Long-term Targeted Status and Trend Monitoring Compliance Monitoring	Continue annual thermograph deployment along longitudinal profile.	9.4 (6), p. 9-13; 9.5 (2), p. 9-17	**High** (Sustain long-term record)	USFS
	Continue annual fine sediment monitoring (via McNeil core samples) using existing reaches and transect sites.	9.4 (5), p. 9-13	**High** (Sustain long-term record)	USFS
	Continue ambient water quality monitoring of all water quality parameters (nutrients, nitrates, pH, temperature, fecal coliform, etc.) at Ecology site 46A070 (Keystone Gage)	9.5 (2), p. 9-17; 9.5 (3) & 9.5 (4), p. 18; 9.5 (8), p. 9-19	**High** (Sustain long-term record)	WDOE
	Continue to monitor ENFH water discharges for compliance with NPDES permit guidelines.	9.5 (5), p. 9-18	**High**	USFWS WDOE
Upland Status and Trend	Endangered, Threatened and Candidate plant and animal species; Species of Concern		**High** (Tied to ESA and Forest Plan)	USFS USFWS WDFW
	Area occupied by noxious weeds, species present		Medium (Not immediate need; long-term)	USFS Chelan Co - Weed Control Board
	Monitor vegetative and landscape recovery from past disturbance, i.e. fire		Medium (Not immediate need; long-term)	USFS Entiat RD and PNW Forest Sciences Lab

Table 17. Summary of ongoing monitoring activities in the Entiat subbasin and associated annual cost estimates.

Parameter	Monitoring Type	Monitoring Agency	How/Method	Scope	2004 cost	2005 cost	Funding Agency	Comments
Water temperature	Long-term/Baseline - Targeted Status and Trend; Compliance Monitoring	USFS	Annual deployment of onset dataloggers	30 sites total including Entiat & Mad longitudinal profiles & 9 tributaries, 26 sites mid-June to mid-Sept, 4 sites year round	$10,000	[1] $4,134	USFS	USFS budget was cut in 2005. Unstable funding - See Notes page, footnote 1.
Fine sediment	Long-term/Baseline - Targeted Status and Trend; Compliance Monitoring	USFS	Annual McNeil Core Sampling (percent fine sediment ≤1 mm in spawning gravel)	60 samples total, 4 Entiat reaches, 1 Mad reach	$9,800	[2] $5,858	USFS	USFS budget was cut in 2005. Unstable funding - See notes page, footnote2.
Steelhead redds – Entiat River	Targeted Status/Trend	USFWS	Annual spawning ground surveys	Entiat River Miles 0.5 to 30, multiple replicates	$24,800	$44,600	[3] USFWS and NMFS	See notes page, footnote 3
Steelhead redds – Mad River	Targeted Status/Trend	USFS	Annual spawning ground surveys	Mad River Index reach (RM 1 to 7), 4 replicates	$3,200	[4] $3,845	USFS	See notes page footnote 4.
Remote steelhead PIT tagging	Targeted Status/Trend	USFWS	Angling	Entiat and Mad Rivers		$10,000	USFWS	
Bull trout redds – Entiat River	Targeted Status/Trend	USFWS	Annual spawning ground surveys	Entiat River Miles 30 to 34, multiple replicates	$5,200	$5,200	USFWS	No dedicated annual funding.
Bull trout redds – Mad River	Targeted Status/Trend	USFS	Annual spawning ground surveys	Mad River Index reach (RM 12 to 19), 3 replicates of 3 segments = 9 days	$3,850	[5] $3,500	USFS	See notes page footnote 5.
Bull trout life history	Status/Trend	USFWS	Radio telemetry	Entiat watershed RMs 0 to 34	$70,000	[6] $67,000	USFWS	See notes page footnote 6.
Spring Chinook redds – Entiat and Mad	Targeted Status/Trend	USFWS	Annual spawning ground surveys	Entiat River Miles 16 to 28, multiple replicates Mad River Miles 0 to 4, multiple replicates	$23,500	$24,350	USFWS	
Summer Chinook redds – Entiat and Mad	Targeted Status/Trend	USFWS	Annual spawning ground surveys	Entiat River Miles 0.3 to 4 and 16 to 28, multiple replicates; Mad River Miles lower 0.5, multiple replicates	$23,500	$24,350	USFWS	No dedicated annual funding
Smolts	Targeted Status/Trend	USFWS	Screw trap	@ Entiat RM 6.8 below hatchery	$212,500	$212,500	USFWS	2006 only $65,000 secured; Reduced trap deployment time likely.

Table 17. Summary of ongoing monitoring activities in the Entiat subbasin and associated annual cost estimates (continued).

.Parameter	Monitoring Type	Monitoring Agency	How/Method	Scope	2004 cost	2005 cost	Funding Agency	Comments
Entiat Demo structures effectiveness	Effectiveness (biologic)	USFWS	Annual snorkeling	Entiat RMs 3 to 4.5, 3 structures	$2,000	$2,200	USFWS	No dedicated funding; performed as part of partner agreement
Bridge-to-Bridge Effectiveness	Effectiveness (biologic)	USFWS	snorkeling	Entiat RMs 3 to 7		[7]$45,500	BPA - ISEMP	See Footnote 7.
		TerrAqua, Inc.	Habitat surveys	Targeted Entiat RMs 3 to 7; 10 random / probabilistic sites			BPA - ISEMP	UCSRB Regional Technical Team (RTT) assistance
		CCCD	Site selection support and coordination	Watershed - wide	n/a	$7,000	BPA - ISEMP	
Wilson side-channel and Jon Small Pond effectiveness	Effectiveness (biologic)	WDFW	Hook and line sampling, electroshocking, visual	Targeted project monitoring			WDFW	Performed by WDFW as an EWPU partner.
Demo structure channel cross sections	Effectiveness (physical changes & structural characteristics)	NRCS	Annual total station survey; photographs.	Entiat RMs 3 to 4.5, 3 structures		~$4200	NRCS / CD staff	No dedicated funding; performed as part of partner agreement
Streamflow	Long-term/Baseline - Targeted Status and Trend; Compliance (Chapter 173-546 WAC)	USGS CCCD* USBR USFS	3 Telemetered continuous recording gages	Entiat RMs 1.4 and 18, Mad RM 0.5 (Mad gage no telemetry*)	[9] $36,040 [WY2004]	[10] 38,020 [WY 2005]	[8] USGS USBR USFS	See note page, footnotes 8, 9 & 10. *WY2004:* USGS, USFS & USBR; *WY 2005:* USGS, USBR
Streamflow (Telemetered sites also record air and water temperature)	Targeted Status/Trend Compliance (Chapter 173-546 WAC)	WDOE CCCD	8 Telemetered continuous recording gages; 6 Miscellaneous measurements	<u>Telemetered</u>: 4 Entiat R. (N. Fork, Entiat below falls, Entiat @ Tommy Bridge, Entiat @ Dill Bridge); 1 Mad R. (Mad R @ Camp 9); 3 tributary (Roaring Ck, Tillicum Ck, Lake Ck). <u>Manual stage height staff gages</u>: Pope Creek, Preston Creek, Tommy Creek, Stormy Creek, Potato Creek, Mud Creek	$17,588 to CCCD (Calendar year, not WY)	WDOE internal cost $84,000 to $112, 000; $20,120 to CCCD (Calendar year end 12/31/05)	[11] WDOE	See footnote 11.
Water Quality	Compliance (Federal Clean Water Act)	WDOE	Monthly grab samples / chemical analysis; temperature measurements.	Entiat RM 1.4 (USGS Entiat near Entiat - Keystone gage site)		~ $2200; Does not include reporting.	WDOE	WDOE Site ID 46A070: Only ongoing ambient water quality monitoring station in the Entiat subbasin.

[1] In 2005 the USFS maintained the Entiat & Mad longitudinal stations, but was forced to drop most tributaries and all Chelan subbasin sites.

[2] In 2005 the USFS sampled the 2 lower Entiat reaches but was forced to drop the 2 upper Entiat fine sediment sampling reaches and the Mad River reach. The USFS trained and relied on WSU/4H program high school student assistance for sampling in the Mad River.

[3] Steelhead redd surveys - USFWS received $25,000 from NMFS to conduct redd surveys for 2005-2006.

[4] In 2005, $3000 was budgeted but cost for Mad River steelhead spawning surveys was $3,845 for 4 to 5 replicates during the March through April spawning season.

[5] USFS $1500 funding shortfall in 2005.

[6] Bull trout telemetry - USFWS received $ 45,000/year; actual project costs required $25,000 in additional funding in 2004 and $23,000 in 2005.

[7] BPA ISEMP Entiat Effectiveness Monitoring Study, Bridge-to-Bridge snorkeling. USFWS received $45,000 from BPA. Due to unexpected personnel and equipment needs will require approximately $40,000 in additional funding.

[8] The CCCD has a 50-50 joint funding agreement in place with the USGS for the Operation of its 3 gages in the subbasin. ***The USGS and Federal NSIP Program fund Operation and Maintenance (O&M) Ardenvoir gage. The Conservation District provides 50% of the cost for telemetry at the Ardenvoir gage, 50% of the O&M and telemetry at the Keystone gage, and 50% of the cost for O&M (no telemetry) of the Mad River gage.*** The District owns Sutron equipment that could enable telemetry at the Mad River gage; however, stable annual funding is needed for equipment installation and telemetry to occur. In 2005 the USGS announced that cost-increases would result in approximately an 8% increase in total O&M costs for WY2006 (October 1, 2005 through September 30, 2006), and an additional 8% increase in O&M for WY 2007. The availability of long-term cost-share funding assistance from EWPU federal partners is uncertain. ***Securing a long-term source of annual funding for O&M of all 3 USGS gages is an EWPU water quantity and instream flow monitoring priority. Successful implementation of Chapter 173-546 WAC - the WRIA 46 water resource and instream flow program - is dependent upon continued operation of these important gages.***

[9] In WY 2004 the USFS ($5,000) and Bureau of Reclamation ($7970) funded the Conservation District's portion ($13,350) of its 50-50 joint funding agreement with USGS.

[10] For WY 2005 the Bureau of Reclamation funded the Conservation District's portion ($14,250) of the 50-50 joint funding agreement with USGS for telemetry at the Ardenvoir gage, O&M and telemetry of the Keystone gage, and O&M (no telemetry) at the Mad gage.

[11] Since 2002 the CCCD has received WDOE funding to provide local technical assistance for the Operation & Maintenance of the Entiat Enhanced Streamflow Monitoring network. Funding CCCD assistance has been cut for the past two years. WDOE is working to extend their existing contract with the District until June 30, 2007; no long-term funding is guaranteed at this time. Without future stable grant funding through the WDOE Water Resources Program - SHU, the Entiat enhanced streamflow gaging network may be cut back to 8 (or fewer) continuous recording telemetered sites. Ecology funding for local Conservation District O&M support/staff gage data collection may be further reduced or eliminated. ***Securing a long-term source of annual funding for these gages is a priority.***

11.0

ADAPTIVE MANAGEMENT

Adaptive management is a cyclic, learning-oriented approach to the management of complex environmental systems. It involves monitoring the results of actions (restoration projects, management policies, etc.) that are implemented, and then evaluating and integrating new information obtained through monitoring efforts. The adaptive management process involves developing an understanding of not only which actions worked and which did not, but also why, and using insight gained from the process to alter policy, reassess ecological assumptions, and refine goals and implementation actions as necessary.

11.1 Responding to Local Needs and Concerns

Currently, EWPU quarterly meetings are the primary public forum for discussing ongoing activities, reviewing progress, and addressing new resource concerns as they arise. The EWPU has agreed that its quarterly meeting schedule should remain in place throughout implementation. Independent of EWPU meetings, topic-specific work sessions are held with technical and landowner committee members to work through issues and develop collaborative products based on the best local and scientific knowledge available. Public meetings are also hosted, as needed, to share information about project actions, studies, or management changes that are being proposed, and gather feedback from the larger Entiat community. The Conservation District also utilizes newsletter articles, targeted mailings, and its website to provide information to the public regarding Entiat watershed activities. It has been recommended by the EWPU that work sessions, public events and mailings continue to be utilized during the implementation process.

Since completion of the WRIA 46 Plan in 2004, all of the EWPU's efforts have shifted towards implementing plan actions and monitoring associated changes. Due to the amount of monitoring currently occurring, the number of projects already underway in the valley, and recognition that many more restoration activities will likely be implemented in the Entiat subbasin over the next 10-20 years, the EWPU is working to initiate the use of semi-annual public meetings to help establish a true "adaptive management" process within the watershed. The goal of establishing and convening meetings twice-a-year is to promote and assure ongoing dialogue and critical review of watershed activities and outcomes by resource management staff, members of the Entiat community, and other interested stakeholders.

11.2 Refining Response

In addition to providing a public evaluation and feedback loop, the adaptive management process establishes a mechanism for revising actions based on new scientific information. If monitoring data indicate activities are not producing expected or required results, the EWPU may choose to perform additional studies to further refine understanding of resource issues and how to best restore watershed conditions. If it is determined that conditions (e.g. pH exceedences) are naturally occurring, this data will be used during future regulatory compliance discussions with the appropriate agencies.

Members of the EWPU technical subcommittee are working with UCSRB Regional Technical Team (RTT) staff to develop a comprehensive monitoring program for the Entiat subbasin. The RTT conducts monitoring program and data reviews in January of each year. The Conservation District is working to establish semi-annual EWPU information sharing meetings in coordination with established RTT annual review.

11.3 Process for WRIA 46 Plan and DIP Updates and Revisions

Watersheds are dynamic systems that experience constant change. Consequently, the Entiat watershed plan will need to be updated or amended from time to time to keep it a "living" document and prevent it from becoming a plan that sits on the shelf collecting dust. When additional information is collected through new studies and monitoring, actions may need to be modified to achieve Plan goals. Additionally, new issues may arise that were not considered or addressed during preparation of the WRIA 46 plan, e.g. fisheries issues. The EWPU will review the plan on an annual basis to decide whether enough substantive changes have occurred to warrant WRIA 46 Plan revision. Barring immediate need, overall WRIA 46 Plan updates will likely occur every five years. This timeframe coincides with recommended reevaluation of water use, land use and other trends.

It is envisioned that the EWPU's consensus-based process and forum will be utilized to identify necessary WRIA 46 Plan updates and revisions as implementation proceeds. The Conservation District, as lead agency for the Entiat watershed planning effort, will continue to be responsible for tracking recommended changes and helping to assure that updates are made over time. Any future substantive amendments to WRIA 46 Plan content or Chapter 173-546 WACC are to be negotiated by consensus of members of the EWPU (or its successor) following the procedures outlines in Chapter 90.82.130 RCW.

Updates to the Entiat Detailed Implementation Plan will also need to occur over time; however, rather than performing comprehensive updates to the Entiat DIP itself, coordination and EWPU meetings will be used to create general plans of work that will capture changes to DIP tasks, etc. and define new implementation tasks and responsibilities. Comprehensive DIP updates will occur by consensus of the EWPU or its successor.

11.4 Data Management

Currently there is not a central repository for all Entiat data. The USFS Entiat RD, WDOE and other technical partner agencies manage the data they collect as part of their program and policy mandates. Over the past years, the Conservation District has slowly become a repository for many Entiat technical partner data summaries and reports, e.g. USFWS spawning surveys, USFS temperature and sediment monitoring reports, WDOE water quality data reports. The District has made key background/technical documents for the Entiat now available to the public on its website. A goal of the District is to expand the EWPU portion of its website in the near-term so that it provides a comprehensive bibliography and access to Entiat documents in electronic format, if possible.

The EWPU partner agencies have developed numerous GIS data layers relevant to the Entiat WRIA. The District possesses many of these, and has also created GIS files in association with assessments that have been performed within the Entiat subbasin. As part overall data management framework development, the CCCD is working to create metadata for all shapefiles in the "Entiat Geographic Data System", and update coverages as necessary so that there is adequate documentation, assurance that the information is current, and nonproprietary/sensitive data may be shared with the public and other agencies online in the future. Documentation for all data that has been/is collected by the District under WDOE grants must meet the "10 Year Rule". The 10-Year Rule requires that documentation be sufficient to allow a person to understand the purpose of the data set, methods used, results obtained, and the quality assurance measures taken ten years after the data is collected.

The USFS Entiat RD and District together hold much project-level information for the subbasin. The CCCD and Chelan County are currently working to provide online access to non-sensitive restoration project information for the Entiat and Wenatchee, e.g. project type and location, funding sources, partners, through use of a web-based interface that will be accessible to the public. It is anticipated that Entiat project data entry will be completed by the District, as appropriate, in 2006.

Development of an overall monitoring data repository and hosting strategy is a high priority for the EWPU, particularly because many monitoring activities are already occurring within the Entiat subbasin. Members of the UCSRB RTT and the Northwest Fisheries Science Center are collaborating on the development of a web-based data repository and retrieval framework. The pilot Integrated Status and Effectiveness Monitoring Program (ISEMP) data management system is being developed to house and provide access to QA/QC'd data collected in Upper Columbia region using protocols from the Upper Columbia Biological Monitoring Strategy (Hillman 2004). Data being collected as part of the pilot Entiat Effectiveness Monitoring Study will be input into the pilot ISEMP system in the future, and members of the EWPU and RTT are discussing options for storage of other Entiat data in the pilot data management system. The goal of the EWPU is to provide partner and public access to Entiat data within a management framework that utilizes common standards, so that the information will benefit both local and regional long-term monitoring and adaptive management processes.

12.0 REASONABLE CERTAINTY

It is widely acknowledged that, in addition to ongoing agency support, successful implementation of most WRIA 46 Plan actions will require the continued voluntary cooperation and participation of many private landowners in the Entiat valley. It is also recognized that all Conservation District staff support for the Entiat watershed effort, and the EWPU's on-the-ground project activities, are reliant on soft money. Given the lack of a guaranteed annual oversight and operation budget, future legislative appropriations of Phase 4 - Implementation money and the availability of project, research and monitoring grant dollars will directly affect the ability of the EWPU to sustain its efforts and the degree to which actions are implemented.

Regardless of the uncertainties described above and in previous parts of this document, the EWPU believes that the numerous "early action" implementation activities that have already been completed or are underway provide reasonable certainty that the Entiat Planning Unit and community will continue to collaboratively implement actions recommended in the WRIA 46 management plan and subsequent complimentary documents. The collaborative approach of the EWPU provides additional certainty that project implementation will occur. Technical match, in-kind donations, and cost-sharing on among partner agencies, landowners and others are used to the maximum extent possible in order reduce overall project cost and leverage resources to meet the EWPU's shared implementation and monitoring goals.

12.1 Letters of Support

During the WRIA 46 Plan approval process, many members of the EPWU committed to support the group's ongoing efforts through provision of technical, in-kind and financial resources. Copies of written letters of support may be found in Appendix I.

12.2 Funding [RCW 90.82.043 (3)]

A number of funding sources are available to continue and expand upon the work of the EWPU to implement WRIA 46 Plan actions. Common grant sources available for project, research, outreach and monitoring activities at the time this document was published include:

Table 18. Common grant funding sources available for implementation.

Source	Management Entity
Centennial Clean Water Fund/Clean Water Act Section 319 Nonpoint Source Fund/Washington State Water Pollution Control Revolving Loan Fund	Department of Ecology
Watershed Planning and Implementation	
Salmon Recovery Funding	Interagency Committee for Outdoor Recreation
Northwest Power and Conservation Council Fish and Wildlife Program	Bonneville Power Administration
HCP Tributary fund for Rock Island and Rocky Reach hydroelectric projects; Grant PUD habitat account.	Chelan County Public Utility District; Grant County Public Utility District.
Partners for Fish and Wildlife, FIRMS	US Fish and Wildlife Service

The Conservation District currently utilizes or is actively pursuing funds from all of the sources listed above, except the Centennial Clean Water Fund, to support the Planning Unit's activities. Chelan County is also contributing some of its lead entity funds to support different aspects of the EWPU's implementation efforts. While these are generally stable sources of funding, they may change over time. New initiatives, political interest, and legislation may create opportunities not available at this time; conversely, some existing grant programs may be eliminated in the future. As additional funding sources become available, the Conservation District and other EWPU members will pursue them to accomplish the EWPU's implementation objectives. After completion of this document, the Conservation District plans to develop a catalog of the many smaller grant options that are available, application timelines and other pertinent information so that funding may be pursued from these as-yet-unexplored sources as well. Details about other potential sources of funding, eligible grant activities and match requirements may be found in Appendix J.

13.0 REFERENCES

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