

# APPENDIX A - WRIA 46 PLAN RECOMMENDATIONS

## 9.1 Introduction

This chapter is the heart of the WRIA 46 Management Plan. The Watershed Assessment Entiat Analysis Area (USFS WNF 1996), Entiat River Inventory and Analysis (CCCD 1998), and Final Coordinated Resource Management Plan/First Draft WRIA 46 Plan (CCCD 2002) provide the foundation for this document. Significant issues identified during the watershed assessment work conducted over the last ten years are documented here. This chapter describes existing conditions underlying each of these issues and, most importantly, details recommended actions that best respond to issues. Other management strategies specifically tailored to address resource issues on National Forest System and BLM lands in WRIA 46 are documented in the Chapter 2, Synthesis Summary Tables.

The Planning Unit deems that all of the data, methodologies and assessments contained in this document are the best science available given the time and funding expended to date. Therefore, the EWPU recommends that the results from these studies be used to move forward with the actions contained in this chapter.

Recommendations in this chapter are designed to help attain the community, economic, and ecologic objectives captured in the Vision and Goals of the Planning Unit. This chapter includes recommendations for:

- implementation of actions to address issues;
- monitoring to evaluate resource conditions and the results of our actions; and
- additional studies needed to better understand some priority resource conditions.

Section 9.2, General Recommendations, outlines actions that are needed to maintain the basic framework necessary for implementation of this plan. Sections 9.3 through 9.5 group recommendations by analysis component (water quantity, instream flow, habitat and water quality) and references are provided to the chapter(s) in the plan where supporting information is contained. Section 9.6 includes a set of additional issues that span multiple resource issues.

Although this chapter categorizes recommendations, it is important to recognize that all recommendations are intertwined and compliment one another. An action like changing channel geometry (shape), listed in the “Habitat” section, will improve habitat but also help water quality and instream flow conditions, as well as mitigate for future water uses.

The strength of this plan derives from two fundamental points:

- 1) ***Development of the plan occurred via a local effort to address both community and ecological issues.*** Recommendations have been 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 continue to be implemented in an informed and coordinated manner, recognizing the many linkages that exist between components in this plan.

Projects proposed in the Entiat WRIA by groups involved with development and implementation of activities stemming from other planning efforts should look to the recommendations provided in this document for overall guidance and strategic direction. It is critical for the successful implementation of this plan that these groups communicate/coordinate their actions with the CCCD/EWPU. Care must be taken not to implement one recommendation independent of the other recommendations without consideration of how singular action may affect other related actions. The Planning Unit hopes to continue serving in an advisory capacity throughout the implementation of this plan in order to assure that future projects are complementary and cost-efficient.

### **9.1.1 Overarching Principles**

The Entiat has a long history of citizen participation in resource management efforts. The Planning Unit recognizes the close connection between community well-being and watershed conditions, and as a result a set of basic principles regarding the past, present and future of WRIA 46 became clear during this planning process. The Planning Unit therefore acknowledges the following overarching principles:

- Continued community participation and involvement with the EWPU is necessary to ensure its future success and achievement of the group's vision and goals;
- Future projects proposed in the WRIA need to be communicated to and coordinated with the CCCD/Planning Unit in order to reduce duplication of effort and assure compatibility with this strategic plan;
- Monitoring and continual feedback are key to the design of future projects and tracking progress towards the achievement of desired results;
- Surface and ground water in the subbasin have a high degree of connectivity; therefore surface and groundwater in the watershed should be treated as one source for all water quality, quantity, habitat and instream flow actions;
- The upper Entiat River watershed from RM 10.5 (Mad River confluence) upstream is highly functioning and the priority should be anti-degradation and protection of existing conditions, particularly in the stillwater reach;
- The lower Entiat River from the Mad River confluence (RM 10.5) downstream has been most influenced by past activities and should be the priority area for active restoration projects; and
- The tributaries to the mainstem Entiat River are in relatively good condition with respect to water quality; however, variability in habitat and water quality conditions exists.

## 9.2 General Recommendations

The following general recommendations outline the framework necessary for successful implementation of this plan:

- 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;
- The EWPU should 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;
- The EWPU and CCCD should continue to promote and implement collaborative projects and perform monitoring;
- The CCCD and EWPU should continue their support of legislation, project grant proposals, etc. submitted by others for actions or activities that contribute to achievement of WRIA 46 plan goals and recommendations;
- County planning regarding land use should be coordinated with the EWPU and reflect the science in the Entiat Plan;
- Community vitality of the Entiat valley should be addressed during County land use planning and other land development and protection activities;
- State, Federal, Tribal, Local Government, Foundations, local contributions and other funding sources should be secured to continue to support the Planning Unit coordination, administration and facilitation roles of the CCCD, and to fund District staff technical assistance supporting development and implementation of plan recommendations;
- The CCCD should continue to develop and support the Entiat Geographic Information System (EGIS) and maintain its role as primary clearinghouse for WRIA 46 GIS data;
- The Planning Unit should continue to use EGIS for information sharing and analysis, and further explore potential of the tool;
- Monitoring in the Entiat River watershed should be done using protocols consistent with Upper Columbia Salmon Recovery Board (UCSRB) Regional Technical Team (RTT) "Monitoring Strategy for the Upper Columbia Basin" (Hillman 2003, *draft*); and
- The CCCD, on behalf of the Planning Unit, should pursue funding to implement monitoring according to the above strategy.

## 9.3 Water quantity and instream flows

Recommendations in this section are based on information contained in Chapters 4 and 5 of this document, the Entiat Coordinated Resource Management Plan/First Draft WRIA 46 Plan (CCCD 2002) and other supporting technical documents.

1) At present there is no formal program established directing the management of water resources in the Entiat River subbasin. Recognizing the need for a system of managing water resources that balances the instream and out-of-stream needs for water in the subbasin and other resource management objectives, the Planning Unit has developed water resource management recommendations and instream flow recommendations as part of the WRIA 46 watershed planning process. The WDOE, Chelan County and the Planning Unit should work together to implement these recommendations as a complete package:

- WDOE and the Planning Unit should initiate rule making (Chapter 173-546 WAC and/or other) within one (1) year of adoption of this plan by Chelan County to create a water

resource management program that includes a reserve of water for future uses prioritized by use type, qualifying criteria for accessing reserve water, and to establish minimum instream flows in WRIA 46 based on proposed Administrative Instream Flow regimes (see Chapter 5 for biological rationale, percent exceedence values, and additional data pertinent to proposed Administrative Instream Flows listed in the table below);

**Recommended Administrative Instream Flows**

<b>Time Period</b>	<b>Lower Entiat River, Tied to Keystone Gage</b>	<b>Upper Entiat River, Tied to Stormy Gage</b>	<b>Mad River, tied to Mad at Ardenvoir Gage</b>
January	185	175	32
February	185	175	32
March 1-15	185	175	32
March 16-31	250	285	68
April 1-15	250	325	100
April 16-30	350	375	100 Plus 25 cfs limit on new water rights.
May 1-15	474 Plus a 100 cfs limit on new rights.	375 Plus a 100 cfs limit on new water rights.	100 Plus a 25 cfs limit on new water rights
May 16-31	720 Plus a 100 cfs limit on new water rights.	375 Plus a 100 cfs limit on new water rights.	100 Plus a 25 cfs limit on new water rights
June 1-15	898 Plus a 100 cfs limit on new water rights.	325 Plus a 100 cfs limit on new water rights.	100 Plus a 25 cfs limit on new water rights.
June 16-30	617 Plus a 100 cfs limit on new water rights.	325 Plus a 100 cfs limit on new water rights.	100 Plus a 25 cfs limit on new water rights.
July 1-15	359 Plus a 67 cfs limit on new water rights.	275 Plus a 67 cfs limit on new rights.	68
July 16-31	268	275	68
August 1-15	185	275	68
August 16-31	185	275	51
September	185	175	32
October	185	175	32
November	185	175	32
December	185	175	32

- The WDOE and the Planning Unit should consider rulemaking to implement Planning Unit Instream Flow recommendations and associated habitat and water quality actions to assure compliance with the Clean Water Act, the Salmon Recovery Act and/or other non-water resource management programs and laws; (see Chapter 5 for biological rationale and additional data pertinent to proposed Planning Unit Instream Flows listed in the table below);

**Proposed Planning Unit Instream Flows**

<b>Time Period</b>	<b>Lower Entiat River Range, tied to Keystone Gage</b>	<b>Upper Entiat River Range, tied to Stormy Gage</b>	<b>Mad River Range, tied to Mad at Ardenvoir Gage</b>
January	130 (130-145)	120 (110-130)	25 (20-30)
February	130 (130-145)	120 (110-130)	25 (20-30)
March	130 (130-145)	120 (110-130)	31 (30-35)
April	270 (260-290)	240 (240-325)	70
May	474	480	70
June	540 (520-580)	480	55
July	165	275	55
August	165	180	40
September	165	125 (120-135)	25 (20-30)
October	165 (150-185)	120 (110-130)	25 (20-30)
November	130 (130-145)	120 (110-130)	25 (20-30)
December	130 (130-145)	120 (110-130)	25 (20-30)

- The State of Washington, Chelan County, and others responsible for administration of water resources in the Entiat River subbasin shall allow continuation of permit-exempt wells and associated uses as a legal means of appropriating water;
- The Planning Unit should continue to work with the WDOE to set priorities for future water allocations and reserve water use; determine method for processing pending applications and handling of previously conditioned water rights; define how State Trust Water Program, USBR water leasing, and other banking options will be used; outline procedures for use of conserved water and use of stored water; and making determination of water availability. This program should be documented in the detailed implementation plan within one (1) year of initiation of implementation plan development;
- The Planning Unit recommends that any reserve established in rule should be split into categories for management and tracking purposes. For example “residential” use should be split between “in-house domestic” and “domestic irrigation” water use components and higher priority should be assigned to “in-house domestic” use to assure certainty of future in-house domestic use well into the future; and
- The Planning Unit recommends that reserve water for new commercial, agricultural and light industrial enterprises should be limited to use in the lower Entiat River, below the stillwater area (RM 16.2), but that residential water use continue to be allowed above this point.

2) There is a great deal of disparity between actual water use and the amount of water represented by rights and claims. Documentation that most closely reflects actual water use is necessary for effective water resource management:

- A priority action is for the Department of Ecology to work with the planning unit to develop the most defensible means to address uncertainties in the water rights and claims record, such as on a case-by-case basis, general adjudication, or other legal means that may become available to clean up the paper record. The Department of Ecology and Planning Unit should agree to a course of action within one (1) year of initiation of implementation plan development;

- The WDOE and Planning Unit should host community workshops to share information about the WRIA 46 water rights and claims data, and water resource management goals in the Entiat subbasin;
- WDOE should continue to provide technical assistance and cost share on equipment for water metering;
- WDOE should continue to provide education and technical assistance to residents to assure reporting is done in a timely manner, and using formats and procedures to facilitate the rapid transfer of information to interested persons like the members of the Planning Unit;
- The Planning Unit should 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;
- The CCCD, on behalf of the Planning Unit should establish a reporting mechanism / agreement between Chelan County and the CCCD/Planning Unit to share information on permit exempt wells associated with new construction. This should be done within one (1) year of initiation of implementation plan development; and
- The Planning Unit should work with willing citizens in the watershed to meter single household domestic permit exempt wells throughout a representative cross-section of the watershed to refine in-house domestic water use estimates and plan content.

3) Some water right holders in the Entiat River watershed may not currently be exercising some/all of their water right, yet they want to prevent relinquishment while others need water:

- The Planning Unit should host and the State of Washington and partners should support a State Trust Water Program workshop, available to all Entiat valley landowners defining the trust water program, water acquisition program, water right lease options, water transfer option, and related opportunities (USBR). This workshop should be held within one (1) year of adoption of this plan by Chelan County, so that a specific program can be included in the detailed implementation plan; and
- The Planning Unit should work with the Department of Ecology to develop a detailed water conservation, trust water, and water acquisition program for the Entiat River subbasin in order to help assure adequate water for community growth in the future, and include said program in its detailed implementation plan.

4) Water conservation in the Entiat River watershed will help meet management goals and provide additional water for instream and out-of-stream uses:

- The Planning Unit and local partners should continue to pursue water conveyance efficiency improvements throughout the Entiat watershed;
- The Planning Unit, U.S. Bureau of Reclamation (USBR), the Natural Resource Conservation Service (NRCS), and the CCCD should continue to work on alternative projects to consolidate the Knapp-Wham and Hanan-Detwiler irrigation ditches ;
- The Planning Unit should encourage all Entiat River watershed water users to work to convert open irrigation systems to piped systems as assisted by local, state, federal, and tribal partners;
- The CCCD and Planning Unit should continue to seek funding from USBR and partners to upgrade inefficient/ineffective surface water diversion structures;
- The Planning Unit should explore use of the voluntary Comprehensive Irrigation District Management Process (CIDMP) and other resources available to Districts, either through the existing Entiat Irrigation District and/or potential new district;
- The CCCD and Planning Unit should work with the City of Entiat and Entiat Irrigation District to obtain funds for a feasibility study for extending City of Entiat municipal water system and

Entiat Irrigation District irrigation distribution systems upstream to serve new uses, and to consolidate existing uses;

- The Planning Unit recommends that water users in the Entiat River watershed continue conversion of surface water diversions to ground water / well withdrawals when/where feasible;
- The NRCS and other partners should continue to provide technical and financial assistance to improve on-farm irrigation application efficiency, scheduling, and promote/improve water conservation.
  - Encourage Federal Government to fully fund farm bill programs and other cost-share programs supporting water conservation work;
- The State should continue to fund Referendum 38 (improvements to public water-supply systems and public irrigation districts);
- The Planning Unit and partners should promote water efficient landscaping, and host a workshop and/or trade show available to local water users; and
- The City of Entiat and appropriate system managers should solicit training from the Department of Ecology and other appropriate entities, within six (6) months of adoption of this plan by Chelan County, regarding reclaimed water use.

5) While the existing entities responsible for resource management in the Entiat River watershed are working well together through the Entiat WRIA Planning Unit, institutional changes or creation of additional institutions may be necessary to more fully implement water and other natural resource management recommendations in the Entiat subbasin:

- Local irrigators should explore the potential of consolidating the Knapp-Wham, Hanan-Detwiler, and possibly other systems into a single irrigation district under Chapter 87.03 Revised Code of Washington (RCW). Recommendations regarding organization under Chapter 87.03 RCW should be included in the detailed implementation plan within one (1) year of adoption of this plan by Chelan County; and
- The Planning Unit recommends that a local water advisory group be established, potentially as a sub-committee of the Planning Unit, to track implementation of the water resources management program, recommended instream flows, and related activities that will be codified in Chapter 173-546 (and/or other chapter) WAC.

6) This plan has determined that if the recommended water resource program is fully implemented, water will be available for storage in the Entiat River subbasin. However, suitable storage sites and feasibility of their construction have not yet been fully explored:

- The CCCD, on behalf of the Planning Unit, should assure that a study or studies be completed to explore surface water and ground water storage options and identify potential locations either on the surface or in sub-surface confined or unconfined alluvial aquifers, in order to provide additional water for future community growth and beneficial out-of-stream uses; and
- Any potential storage sites and estimates of costs required to establish the sites should be included in the detailed implementation plan.

7) Areas of surface water-groundwater interchange and subsurface water movement affect the ability of water managers to carefully manage water resources, water quality, instream flow, and habitat programs in the watershed. These interchange and sub-surface flow areas are not fully understood:

- The CCCD should work with WDOE and other staff to update NWI data to reflect known, field checked wetlands in the WRIA (to help show areas of interaction);
- The CCCD, on behalf of the Planning Unit, should assure that areas of subirrigated pasture identified by CWU assessment are adequately checked against actual conditions;

- The CCCD, on behalf of the Planning Unit, should pursue funding of a study of flows through alluvial fans;
- The CCCD, on behalf of the Planning Unit, should pursue opportunities for additional gain loss study work during July (highest irrigation use month) and October (lowest flow period), prior to rains if possible, to capture data after most irrigation ends;
- The CCCD, on behalf of the Planning Unit, should seek funding for a study of water exiting the watershed as surface water vs. groundwater; and
- The Planning Unit should use the supplemental assessments described above to refine water resource, instream flow, habitat, and water quality recommendations. The CCCD is should continue providing planning unit members new information when collected, convening the Planning Unit, and facilitating and documenting plan revisions.

### **9.3.1 Monitoring - water quantity and instream flows**

Recommendations in this section are based on information contained in Chapter 4, Water Quantity and Chapter 5, Instream Flows, as well as Chapter 10, Monitoring. These monitoring recommendations pertain specifically to future water resource management in the Entiat subbasin, and are therefore contained as a subsection of 9.3. It is essential to monitor and evaluate water resource actions over time in order to help assure that goals and objectives are being met and determine the efficacy of actions. Additionally, this feedback is necessary for the development of future projects and refinement of plan recommendations.

- The CCCD, on behalf of the Planning Unit, should pursue state, federal, tribal, local, foundation, and other funding to continue monitoring at all existing streamflow and ambient gages. Priority is assigned to assuring that the three (3) USGS streamflow gages (Keystone, Stormy, and Mad at Mill Camp) continue over the long term as administrative and planning unit instream flow recommendations are associated with these gages;
- The CCCD and City of Entiat, on behalf of the Planning Unit, should find funding and willing participants to continue domestic well monitoring and try to fill in geographic gaps in the network with new participants;
- The CCCD, on behalf of the Planning Unit, should continue monitoring population growth on an annual basis using the State of Washington (OFM estimates) and on a decadal basis using federal census data to refine growth, land-use, and water use projections and recommended actions;
- The CCCD, on behalf of the Planning Unit, should track exempt well development annually using WDOE data and proposed County tracking mechanism to assist the to-be-established local water advisory group's efforts to assure full implementation of this plan and to recommend changes as necessary;
- The CCCD, on behalf of the Planning Unit, should monitor new construction occurring using County Planning Department permit data, and provide this information to the to-be-established local water advisory group to assure full implementation of this plan and to recommend changes as necessary;
- The CCCD, on behalf of the Planning Unit, should track new water right applications, permits, certificates, claims and associated geographic and water volumes annually in coordination with WDOE. This information should be provided to the to-be-established local advisory group to assure full implementation of this plan and to recommend changes as necessary;
- The CCCD, EWPU, USFS and partners should support reactivation of the Entiat Experimental Forest project in order to collect additional data, and data collected subsequent to reactivation should be shared with the Planning Unit on an annual basis; and



- Chelan County should reassess land use and the Planning Unit should find funding to reassess water use every 5 years, and the CCCD, on behalf of the Planning Unit, should provide this information to the to-be-established local advisory group to assure full implementation of this plan and to recommend changes as necessary.

## 9.4 Habitat

Habitat recommendations contained in this section are based on information in Chapter 7 of this plan, and supporting documents. They incorporate and build upon recommended actions that have already been committed to by the Planning Unit, such as those contained in the Entiat River Inventory and Analysis (CCCD 1998; see Reports folder on the CD) and Final Entiat Coordinated Resource Management Plan (CCCD 2002).

1) Stream channel geometry (shape) in the upper Entiat River (RM 16.2 to RM 33.8) has not been significantly affected by human actions in the watershed. Channel geometry in the lower Entiat River (RM 16.2 to mouth) has been modified by past human activities including bank armoring, channelization, woody debris removal, and removal of riparian vegetation particularly from the Mad River confluence (RM 10.5) downstream to the confluence of the Entiat and Columbia Rivers.

- The CCCD and partners should seek funding, permitting, means to monitor and otherwise fully implement Ecosystem Diagnosis and Treatment (EDT) Alternative 5, on behalf of the Planning Unit. This alternative incorporates the strategic actions (instream structures, revegetation) outlined in Alternative 4 of the Entiat River Inventory and Analysis, and includes additional steps modeled with EDT such as the reconnection of off channel habitats, placement of large woody debris structures in the stillwater reach of the upper Entiat, and habitat protection (see table below).

**EDT Alternative Management Scenarios**

Actions	Cross Vanes or other instream structures (Reaches 2-9)	Riparian Plantings (Reaches 2-9)	Log / LWD Placement	Side Channel Connection ( Reach 3)	Irrigation Ditch as Habitat	Habitat Protection and Restoration (Reaches 10,11,12)
Alternatives	(structures)	(lineal feet)	(sites)	Yes / No	Yes / No	(sites)
1	20	10,000	5	No	No	No
2	40	20,000	10	No	No	No
3	80	40,000	20	No	No	No
4	80	40,000	20+	Yes / No	Yes / No	Yes / No
5	80	50,000	40	Yes / No	Yes / No	Yes / No

- Habitat protection projects such as the establishment of conservation easements, leases, and other options should first be pursued with willing landowners rather than outright property acquisition (in order to preserve community tax base);
- The CCCD and partners, on behalf of the Planning Unit, should continue active restoration work in the “Bridge to Bridge” reach (~RM 3.2 - 4.5) to capitalize on connectivity to existing instream habitat restoration sites, and proceed upstream from there;

- The CCCD, NRCS, USFWS, BLM, landowners, and partners, on behalf of the Planning Unit, should continue cooperative monitoring of existing instream structures, associated channel geometry, and fish species utilization on an annual basis; and
- The CCCD, NRCS, USFWS, BLM, landowners, and partners should pursue funding and/or use existing partnerships to monitor new habitat improvement projects; and
- Monitoring results should be used to refine management recommendations as necessary.

2) Riparian condition has been altered by natural (fire) and human disturbances. Riparian vegetation is necessary for bank stabilization, large woody debris recruitment, and stream temperature moderation.

- The CCCD and partners, on behalf of the Planning Unit, should implement targeted riparian restoration and enhancement projects, based on priorities established by the Entiat River Inventory and Analysis data, CWU vegetation community classification study, and ground truthing by CCCD staff as described in this plan (see tables below and on the following page);

**General streambank planting recommendations from 1995 NRCS study.**

Reach	Length (miles)	Reach Description	Canopy Cover (%)	Potential Planting Sites (feet)	Dominant Plant Community
1	2.3	End of slackwater to Fire Station bridge.	0-10	4700	cottonwood/ red osier dogwood
2	3.0	Fire Station bridge to Old Hatchery bridge.	0-10	5900	cottonwood/ red osier dogwood/ erect willow
3	2.7	Old Hatchery Bridge to Johnson/Steven's bridge.	0-10	3900	cottonwood/ erect willow
4	3.0	Johnson/Steven's bridge to bridge near Mud Creek.	0-10	2900	cottonwood/ alder
5	2.2	Bridge near Mud Creek to Ryan/Small bridge.	10-20	2000	cottonwood/alder conifer/alder
6	2.2	Ryan/Small bridge to terminal moraine at Shorty's	0-10	10,350	mixed conifer/ alder
7	2.2	Terminal moraine at Shorty's to USGS gaging station.	0-10	6600	river birch/ broadleaf sedge
8	2.5	USGS gaging station to USFS boundary (section 14).	20-30	3600	cottonwood/ river birch/ red osier dogwood
<b>Total</b>	<b>20.1</b>			<b>39,950 (7.6 miles)</b>	

**Additional priority planting recommendations not previously detailed by 1995 NRCS study.**

Approximate location	Description of site/rationale
RM 1.2 - 3.2	Keystone Ranch to Fire Station Bridge near rock cross vane
RM 3-5 and RM6-7	Areas shown by CWU study to have largest decrease in riparian area from 1945-1998.
RM 4.2	Old Naumes warehouse site
RMs 7-9	Near Roaring Creek to Morical Canyon
RM 10.2	Mad River confluence old Mill site
RMs 11-13	Near Mud Creek confluence to Medsker Canyon
RMs 14-16	McKenzie Canyon to Potato Creek moraine – heavy Tye Fire effects.

- The CCCD and partners, on behalf of the Planning Unit, should perform public outreach to inform community members about the reasons for and benefits of maintaining riparian vegetation. This work should begin within six (6) months of adoption of this plan by Chelan County;
- The CCCD, on behalf of the EWPU, should inform community members about the Conservation Reserve Enhancement Program (CREP) and other options for cost-share on revegetation projects or easement renting;
- The CCCD and partners, on behalf of the Planning Unit, should develop streamside revegetation partnerships with willing landowners. Documentation of the first of these partnerships should be included in the detailed implementation plan due one (1) year after initiation of implementation planning;
- The CCCD and partners, on behalf of the Planning Unit, should pursue conservation easement, lease, and options other than outright property acquisition (in order to preserve community tax base) with willing landowners to protect larger, undisturbed riparian areas, and include a prioritized list of area in the detailed implementation plan to be completed one (1) year after initiation of implementation plan development;
- The CCCD and partners, on behalf of the Planning Unit, should assure monitoring of streambank planting projects, and report progress to the Planning Unit.

3) Wetlands along the upper mainstem Entiat River adjacent to the reach above the Potato Creek moraine serve important hydrologic and biologic functions in the Entiat River. Wetlands along the lower reach of the river have been modified by flood control work and development and only a few wetlands exist.

- The County, Corps of Engineers, and State of Washington should assure that landuse actions comply with existing regulations related to wetlands protection, and provide periodic update to the Planning Unit upon request of the Planning Unit;
- Local, state, federal, and other partners should assist landowners with voluntary maintenance of existing wetlands, or enhancement of the few remaining wetlands and their function; and,
- Local, State, federal, and other partners should work with the CCCD to assure that updates to existing NWI maps are included in the EGIS.

4) Some existing surface water diversions and culverts in the Entiat River watershed are problematic for fish:

- The Planning Unit should use information contained in the 1997 WDFW study, and proposed for collection by the WDFW under Bonneville Power Administration funding, to prioritize surface water diversion/withdrawal point corrections. The Planning Unit should include the project identification and prioritization schedule in its detailed implementation plan;

- The CCCD and Planning Unit should continue to seek funding from USBR, WDFW and other sources to screen and/or upgrade existing screens on pumps/diversion intakes;
- The Planning Unit should continue to show support for Congress granting the USBR construction authority for screening and barrier removal projects;
- The Planning Unit should use information contained in the 2000 County culvert assessment, and proposed for collection by the WDFW under Bonneville Power Administration funding, to prioritize culvert corrections; and
- The County, USFS, WDFW, USFWS, CCCD and partners should continue to seek funds for repairs (or directly fund repairs) of culverts that present fish passage problems.

5) Fish habitat in the Entiat River watershed is adversely affected by excessive fine sediment, which can suffocate redds and cause substrate embeddedness.

- USFS and partners should continue fine sediment monitoring using McNeil core sampling, and implement probabilistic monitoring described in the UCSRB-RTT “Monitoring Strategy for the Upper Columbia River Basin” (Hillman, T.W. 2003);
- Reporting of results to the Planning Unit should be continued; and
- The Planning Unit should use monitoring results to refine management recommendations as necessary.

6) Winter habitat conditions have been identified as a factor limiting salmonid survival in the Entiat River watershed. Of particular concern are the effects of cold water temperatures and anchor ice on egg and fry survival.

- USFS, WDOE and CCCD, on behalf of the Planning Unit, should continue thermograph deployment and monitoring of winter temperatures, and the effects of anchor ice on salmonid survival. An update of potential causes and actions to remediate effects of cold temperatures on salmonid survival should be provided to the Planning Unit on an annual basis, or on a schedule requested by the Planning Unit so that the Planning Unit can use the information to prioritize plan actions;
- The CCCD, on behalf of the Planning Unit, should pursue grant funding to implement riparian planting and channel geomorphology restoration projects in the bridge-to-bridge reach and other areas where enhancement of riparian and geomorphic condition might significantly enhance over-winter and other salmonid habitat conditions; and
- The CCCD and implementing partners, on behalf of the Planning Unit, should monitor the effects of additional riparian vegetation and in-channel projects on winter water temperatures and anchor ice formation. The CCCD and implementing partners should report findings to the Planning Unit to enable re-prioritization of plan actions.

7) The Entiat subbasin is utilized by salmonids protected as threatened and endangered under the Endangered Species Act (ESA). Protection and restoration of fish habitat sufficient to assure adequate habitat for salmonid recovery and to provide certainty for land and water users in the watershed under the ESA are goals of the Planning Unit. Implementation of a comprehensive watershed protection and restoration effort like the program recommended in this plan is intended to work toward, or reach these goals.

- CCCD, on behalf of Planning Unit, will assure that actions are taken to Implement aforementioned channel geometry and riparian restoration recommendations, irrigation diversion structure improvements, and screening improvements;
- CCCD, USFS, WDOE, WDFW, USFWS, BLM, Yakama Nation, and other partners, on behalf of the Planning Unit, should continue habitat monitoring (fine sediment, temperature, channel geometry, etc.), and sharing information with the CCCD for inclusion in EGIS and sharing with the full Planning Unit;

- USFS, USFWS, and the Chelan County PUD, on behalf of the Planning Unit, should continue spring and late run Chinook, steelhead, and bull trout surveys and monitoring in the Entiat River Watershed. Monitoring information should be provided to the CCCD for inclusion in EGIS, and distribution to Planning Unit members to assure new information influences prioritization of plan actions to be implemented;
- USFS, USFWS, and partners, on behalf of the Planning Unit, should continue fish distribution, abundance, and redd mapping in the Entiat River watershed, and provide such information to the CCCD for inclusion in EGIS and distribution to the full Planning Unit. The Planning Unit should use monitoring information to adjust priorities of plan recommendations;
- The USFWS should continue monitoring of salmonid outmigrants via smolt traps, and potentially expand monitoring efforts consistent with the Upper Columbia Basin monitoring strategy (Hillman, T.W. 2003);
- Subbasin planning and Upper Columbia Salmon Recovery Unit partners should perform additional EDT model runs for steelhead and other fish species, and provide copies of results to the CCCD for inclusion in EGIS and for distribution to the full Planning Unit. The Planning Unit should use new information to make any necessary adjustments to plan recommendations or priorities as new information becomes available;
- Current and future regulatory programs developed by the County to protect and restore fish and wildlife habitat and other critical areas should be coordinated with the EWPU, and should take into account current and future restoration and protection projects being undertaken; and
- The CCCD and partners, on behalf of the Planning Unit, should work to develop a Habitat conservation Plan (HCP) and/or salmon recovery plan to gain certainty under the ESA.

8) It is important to consider not only the habitat requirements of threatened and endangered salmonids and other species when developing a watershed restoration plan, but it is also important to consider the genetic makeup of stocks managed to best understand how to protect the genetic integrity of the species of concern. The genetic makeup of fish currently utilizing the Entiat River watershed is not well understood.

- The USFWS and partners, on behalf of the Planning Unit, should continue annual salmon carcass collection and DNA sampling. Results of genetic analyses should be provided to the CCCD on an annual basis for inclusion in the EGIS and distribution to the full Planning Unit;
- The Planning Unit should support USFWS proposal for bull trout genetic studies;
- The USFWS and USFS should pursue abundance and distribution studies on native fish species of interest (lamprey, cutthroat); and
- The Planning Unit should use genetic stock information to make any necessary adjustments to plan elements or priorities, as appropriate, based on new information received.

9) Watershed and riverine resource management is driven by a number of natural processes including sediment. The sediment budget, bedload transport dynamics, and its relationship to channel geomorphology in the mainstem Entiat River are not completely understood.

- The Yakama Nation, USFS and partners, on behalf of the Planning Unit, should initiate sediment budget, sediment transport, and/or analysis of bedload dynamics using acceptable methods (e.g. scour chains) to improve our understanding of this aspect of the system. Data should be provided to the CCCD for inclusion in EGIS and distribution to the full Planning Unit;
- The Planning Unit should continue its support of the ongoing assessment of gravel clusters, and results of the study should be presented to the EWPU; and
- The Planning Unit should consider this information in its evaluation of efficacy of plan recommendations, and for adjustment of plan recommendations or priorities.

10) Roads on forest lands were built primarily for timber access. Riparian vegetation has been reduced and sediment delivery to streams has increased as a result of many unpaved roads being located close to streams. The rehabilitation of roads by forest land managers is a watershed restoration priority.

- The USFS, BLM, State, County, Longview Fibre Co., and partners, on behalf of the Planning Unit, should coordinate road management with major land owners in intermingled ownership areas to help reduce erosion and sediment from road sources.

11) Noxious weed infestations are common in disturbed areas throughout the WRIA, especially along roads and right of ways, and in abandoned pastures and cultivated fields. Noxious weeds reduce the biotic integrity and diversity in the watershed effecting quality of life for people, fish, and wildlife.

- The CCCD, NRCS, USFS, State, County, and partners, on behalf of the Planning Unit, should develop a comprehensive weed control program with landowners, the County Weed Control Board, and State and other federal agencies. Parties responsible for developing the weed control program, and a schedule for implementation should be included in the detailed implementation plan due one (1) year after initiation of implementation plan development;
- The CCCD and NRCS, on behalf of the Planning Unit, should encourage voluntary landowner efforts to control noxious weeds on their properties; and
- The Planning Unit should explore potential for use of biological agents (e.g., weevils) for noxious weed control, and update management recommendations as necessary.

12) Wildlife species protected as threatened or endangered under the Endangered Species Act use habitat on public lands and some private lands within the Entiat WRIA.

- The Planning Unit should 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;
- The CCCD and partners, on behalf of the Planning Unit, should continue to apply for grant funds for priority riparian and terrestrial habitat projects;
- The CCCD and project proponents should continue to monitor the success of habitat improvement projects. Monitoring information obtained should be provided to the CCCD for inclusion in EGIS, and distribution to the full Planning Unit; and
- The Planning Unit should use the new monitoring information to make any necessary adjustment to plan recommendations or priorities.

13) Plant species that are listed under the ESA and/or are species of concern for State and Federal agencies are present within the Entiat WRIA. Plants with cultural resource significance also exist.

- The Planning Unit should provide information to the public regarding the identification, significance, and protection of plant resources in the Entiat WRIA.

14) Benthic macroinvertebrates (aquatic insects) can be a powerful indicator of watershed health, habitat quality, and water quality. Some macroinvertebrate sampling has been done in the Entiat River watershed. In 1992 the USFS sampled one site in the lower Mad River and one site in the lower Entiat River. In 2002 the WDOE sampled one site in the lower Entiat River near Keystone gage. Results indicate that the benthic macroinvertebrate community condition is generally healthy; however, additional sampling is warranted to be able to make stronger inferences about watershed health, habitat quality, and water quality.

- The CCCD and partners, on behalf of the Planning Unit, should seek funding to implement a probabilistic survey (n=50 minimum) of the macroinvertebrate community and other relevant

parameters, consistent with UCSRB monitoring protocol to assess overall health of the subbasin (Hillman, T.W. 2003).

## 9.5 Water Quality

Additional information related to this suite of recommendations may be found in Chapter 8, Water Quality. Analysis of ambient water quality monitoring data collected near the Keystone gage (WDOE station 46A070) and elsewhere throughout the subbasin has shown that overall there are very few water quality problems in the Entiat or Mad Rivers and their tributaries.

1) The WDOE ambient water quality station 46A070 has contributed the most long-term data to the overall water quality record for the subbasin.

- The WDOE should continue monitoring all water quality parameters for which data are currently collected at this site; and
- The CCCD, on behalf of the EWPU, should explore implementation of a probabilistic water quality monitoring program within the Entiat subbasin as outlined in the Monitoring Strategy for the Upper Columbia Basin (Hillman, T.W. 2003).

2) Water temperature monitoring has indicated that summer water temperatures in some tributaries (North Fork Entiat, Mad River near Tillicum Creek) and the mainstem Entiat River periodically exceed State standards.

- The CCCD, WDOE, USFS and partners, on behalf of the Planning Unit, should continue current water temperature monitoring via thermograph deployment and gages to assess conditions and trends;
- The CCCD and partners, on behalf of the Planning Unit, should use existing FLIR data to help evaluate cold-water influences as thermal refugia for salmonids and other cold-water species during periods of high water temperature within the system, and to enhance technical staff and Planning Unit knowledge of temperature regimes. The CCCD and partners should incorporate finding in EGIS and share finding with the full Planning Unit. The Planning Unit should use new information to make any appropriate changes to plan recommendations or priorities; and
- The CCCD and partners should pursue funding, permits, etc to fully implement priority items identified with SNTEMP, EDT (Alt 5), and the Entiat River Inventory and Analysis (Alt. 4) to help mitigate summer temperatures and guide improvements including:
  - Any proposed projects that include an aggressive approach to increasing the current riparian shade conditions throughout the watershed to achieve site potential shade, given the natural limitations of climax vegetation;
  - Any projects that work to achieve a 50% increase in canopy cover system-wide over the long term;
  - Any projects that work towards a system-wide goal of 25-30% increase in canopy cover in the short term;
  - Any projects in the upper river where current riparian shade is already estimated to be 20-30% (RMs 18-34), it is probably infeasible to increase these conditions by 50% (thus achieving 80% canopy cover), and therefore the goal in these reaches should be to increase these conditions up to the site potential shade; and
  - If resources are available, any project that results in decreases to channel width in the lower 10 RMs in conjunction with changes in shade (SNTEMP Alternative Action 4) should be implemented; thus, in the lower 10 RMs, the goal is to increase shade

50% and decrease channel width 50% in order to effect the most significant change to water temperatures.

3) Nutrient loading caused by fertilization has not been identified as a problem in the Entiat River; however, the percentage of scraper life-history type macroinvertebrates (32%) indicates that artificially enhanced nutrient-driven periphyton production may be occurring. Although periphyton occurs naturally in the Entiat and other watersheds, exceedingly high levels may lead to pH and other water quality problems.

- The WDOE should continue ambient water quality monitoring of nutrients in the Entiat River at site 46A070 and should report findings to the CCCD on an annual basis for inclusion in EGIS;
- The CCCD should provide regular update to the full Planning Unit so that the Planning Unit can make any necessary adjustments to plan actions and/or priorities; and
- The CCCD/NRCS should inform community members about farm bill programs related to nutrient management and potential cost-sharing.

4) Recent monitoring has indicated that pH levels occasionally exceed State standards in the lower mainstem Entiat River. The pH increases may be related to photosynthetic activity of periphyton communities, although pH excursions above 8.5 were relatively infrequent (Ehringer 1994).

- The WDOE should continue pH monitoring at ambient monitoring site 46A070 and report findings on an annual basis to the CCCD for inclusion in the EGIS;
- The CCCD should provide periodic update of pH findings to the full Planning Unit to facilitate any necessary adjustments of plan recommendations or priorities; and
- The CCCD, on behalf of the Planning Unit, should explore implementation of probabilistic nutrient monitoring (nitrogen, phosphorous) using Upper Columbia protocol (Hillman, T.W. 2003).

5) The Entiat National Fish Hatchery has a National Point-source Discharge Elimination System (NPDES) permit associated with its production facility.

- USFWS should continue to monitor its water discharges for compliance with NPDES permit guidelines. Monitoring results should be shared with the EWPU on an annual basis; and
- The Planning Unit should use ENFH hatchery water quality monitoring data as appropriate to update plan management recommendations.

6) In 1994 whole fish samples from two suckers collected approximately 0.5 RM upstream from the mouth of the Entiat River indicated elevated levels of t-DDT and PCBs. No fillet samples were collected to assess human health risks.

- The WDOE or an appropriate contractor should conduct supplemental studies that include collection of additional whole-fish samples at a site or sites more representative of conditions in the mainstem Entiat to confirm the levels of DDT and PCB contamination. Finding should be reported to the CCCD for inclusion in the EGIS and reporting to the full Planning Unit;
- The WDOE or an appropriate contractor should collect fillet samples from sport fish from a site or sites representative of the watershed to evaluate potential human health risk. Findings should be reported to the CCCD for inclusion in the EGIS and to be shared with the full Planning Unit; and
- The Planning Unit should use updated whole-fish and fillet sample information to make any necessary changes to plan recommendations or priorities.



7) Recent federal court decisions have called into question the ability of landowners to use pesticides, and maintain economically viable businesses. Pesticide application practices have improved significantly over the past several decades but are again challenged by recent changes.

- Landowners should continue use of established standards and best management practices for pesticide applications;
- The Planning Unit should host a workshop regarding pesticide use and recent federal decisions, and potential effects on best management practices in the Entiat River watershed; and
- The CCCD, on behalf of the Planning Unit, should pursue funding for a study of the levels of pesticides of concern that are used in the subbasin. Monitoring results should be used to update management recommendations.

8) Fecal coliform bacteria and nitrate ambient water quality monitoring results do not indicate water quality problems associated with leaking/failing septic systems, or livestock inputs to streams. Compliance with septic upgrade requirements has been good, although the number of septic systems that have been installed in the valley has increased greatly over the past decade. Continued high-density development of private lands may pose a threat to future water quality, as could future increases to livestock if given unrestricted access to streams.

- The CCCD, on behalf of the Planning Unit, should work with County Department of Health and partners to inform the public about sanitation issues, e.g. septic systems and the importance of proper septic location; livestock BMPs (see 9.6, item 2).
- The WDOE should continue ambient water quality monitoring of nitrate and fecal coliform levels in the Entiat River. The WDOE should provide an annual report of findings to the CCCD for inclusion in the EGIS and for distribution to the full Planning Unit;
- The Planning Unit should use monitoring information to make any appropriate changes to plan recommendations or priorities; and
- If septic systems in need of upgrades are documented, the CCCD and partner agencies should help interested community members identify and secure funding to assist with upgrade costs.

## 9.6 Additional Management Issues

This section covers topics that have implications for multiple resource issues; as such, they do not fit directly within one of the previous categories. Supporting information for this section is found throughout the WRIA 46 plan.

1) New residence and subdivision construction along the river is a concern as it has the potential to degrade the condition of streamside areas and alter the land's ability to mitigate flood flows. There are safety problems associated with construction in the floodplain and on alluvial fans. Dense development could also affect water quality and change the rural feel of the Entiat valley. Chelan County Comprehensive Plan (adopted February 2000) zoning designations now determine property minimum lot sizes and sub-divisibility, and other regulations dictate structure and septic placement requirements, riparian setbacks, and other land use restrictions.

- All construction should follow Chelan County Code requirements for zoning, building permits, structure and septic placement, setbacks, and other land uses;
- All future land use changes should follow appropriate comprehensive plan designation amendment procedures;
- Chelan County, FEMA, and partners, on behalf of the Planning Unit, should inform the public about hazards of construction in flood-prone areas, particularly where new construction is in or adjacent flood-prone areas; and
- Agencies/entities should continue enforcement of their respective codes.

2) An assessment done in 1996 indicated that livestock have unrestricted access to streams and mainstem Entiat River in a few locations, which has denuded stream banks and could affect water quality.

- The CCCD, on behalf of the Planning Unit, should reassess livestock access to streams, map the information, include the information in EGIS, and provide an update to the full Planning Unit;
- The Planning Unit should use updated information to change and/or re-prioritize plan elements;
- The CCCD and NRCS, on behalf of the Planning Unit, should encourage and assist landowners to develop comprehensive farm plans including livestock management planning; and
- The CCCD and NRCS, on behalf of the Planning Unit, should encourage private landowner use of cost-share programs to fence sites where livestock have unlimited access to river, to develop off-stream stock watering sources, or to allow only limited access to streams for watering livestock consistent with comprehensive farm plans.

3) Timber harvest and other silviculture practices on state and private lands are currently at a low level, with little potential for immediate expansion.

- Timber managers should comply with State of Washington Forest Practices Act and obtain appropriate permits, should use Best Management Practices (BMPs), and should go through SEPA review as necessary for any proposed projects.

4) Fire in the rural interface poses a threat to public safety, private property, and watershed resources. Wildfires in the valley have occurred regularly in the past, and are expected to continue on a periodic basis in the future.

- The CCCD, USFS, State, Fire District 8, and partners should provide the public with information regarding fire prevention, planning and protection (e.g. development of a defensible space and fireproofing structures) with priority given to the wildland-urban interface;
- The CCCD, on behalf of the Planning Unit, and interested community members should apply for community fire prevention/protection grants;
- The Chelan County Sheriff and other appropriate groups should continue public education of disaster management and evacuation protocols; and
- The Planning Unit should inform the public about the Columbia Breaks Fire Interpretive Center.

5) Forest road maintenance needs typically exceed annual budgets and there is a concern about federal roads being closed for management and economic reasons. Some roads to private homes are unsafe for firefighter use. Adequate existing road access is needed for firefighting to ensure quick initial attack and safe escape routes.

- The USFS, BLM, State, Fire District 8, and other partners should continue cooperation with rural fire departments to assure adequate and reasonable road access to homes for wildfire protection; and
- Chelan County should continue to assure that county roads meet fire access standards.

## APPENDIX B - USFS SYNTHESIS SUMMARY TABLES

A key product of the USFS watershed assessment process was the description of existing resource conditions, identification of desired ecological conditions, and the development of management strategies that would move elements in the watershed toward the desired future condition (refer to Synthesis Summary Tables section, below). The WRIA 46 Plan incorporated and updated Version 2.0 of the 1996 Watershed Assessment and serves as Version 2.5 of the Watershed Assessment for NFS and BLM lands in the Entiat WRIA.

### **Synthesis Summary Tables**

Table 2-2 illustrates the relationship between the dominant issues that framed the scope of both previous iterations of the federal Watershed Assessment, Entiat Analysis Area. Six management strategy tables on the following pages summarize the significant findings of the assessment. Table 2-3 covers items common to all vegetative groups, and Tables 2-4 through 2-8 correspond to each of the five vegetative groups. Tables 2-4 through 2-8 describe existing and desired ecological conditions, and management strategies to move the existing condition towards the desired condition. Desired conditions are focused on ecological conditions and are not intended to make decisions about the occurrence or intensity of management activities (e.g., developed recreation, grazing, timber harvest). Specific decisions regarding management activities are made at the NEPA planning level.

**Table 2-1. Assessment issues and related management strategies, Entiat Analysis Area.**

Issue	Management Strategies (MS)
Vegetative Structure and Condition	3,8,9,13,15,17,18,28-30,33,34,36,46-50,52-55,58,60,62-64
Wildlife and Fish Populations	1,2,5,6,7,10,12,15,16,18, 23,25,26-37,45,47,49-56, 58,59,62,63
Historic Events/Human Impacts	2-18,21,23,26-31,34,36-42, 46,47,57-59,61,64
Sedimentation	1-7,10-12,17,18,30,34,36,57
Scenic Quality	7,9,11,13-19,21,23,24,30,34,36,38-43,47,49,53,60, 62,63
Watershed Improvement Efforts	1-7,10-12,18,19,27,29,34,36,37,46,47,57,61
Commercial Livestock Grazing	3,6,8,10,25,30,33,44,45,64
Recreation	7,10,11,14,16-24,26,31,42,43,51

More detailed information regarding these results can be found in Chapters 1 through 3 and the supporting appendices of the federal Watershed Assessment; recommended priorities for implementation of proposed management strategies are discussed in Chapter 5 of the Assessment (USFS WNF 1996). Please note that the vegetative groups (e.g., Open Forest) used to organize these tables are delineated based on the potential to develop to the defined group, not the current condition.

**Table 2-2. Conditions and management strategies common to all vegetative groups.**

Existing Condition	Desired Condition	Management Strategies
<p><b>Riparian and Wetland Function:</b> In areas where riparian or wetland function is impaired, conditions may include: reduced sediment buffering, decreased organic matter input (fines to large woody debris), increased temperatures (303(d) listing), unstable banks, reduced water storage, reduced riparian vegetation, channel confinement and increased flow velocities. Diminished riparian and hydrologic function translates into decreased habitat structure and diversity.</p>	<p>Improved riparian/wetland hydrologic function to buffer sediment delivery (ground cover), enhance nutrient cycling, provide wildlife security and thermal cover, improve channel stability and flow regulation. Sustained diverse riparian vegetation condition and structure.</p>	<p><b>1)</b> Designate Riparian Reserves using guidelines from WNF Forest Plan, as amended by the NW Forest Plan, until site-specific analysis can refine width needs. <b>2)</b> Implement actions that promote maintenance or improvement of riparian area function and channel stability (e.g., road upgrade, relocation or obliteration, beaver re-introduction, revegetation, obstruction removal, large woody debris/boulder placement, water chance reconstruction, etc.). Also follow MSs 34 and 36.</p>
<p><b>Soil Quality and Hydrologic Function:</b> Soil productivity losses have occurred due to decreases in ground cover, compaction, concentration of runoff and accelerated erosion. The extent and magnitude of this reduction varies widely over the analysis area, depending on the location and cumulative disturbances involved (grazing, high intensity fire, timber harvest, roads, and recreation). <b>Catchment basins</b> (zero order drainages) provide important hydrologic functions (collection, storage and release) that may be locally impaired by soil compaction and other disturbances.</p>	<p>Soil-hydrologic processes are properly functioning: infiltration/percolation rates, storage and release of water, aeration characteristics and nutrient cycling are restored. Physical/chemical conditions of the soil profile support overstory and vigorous understory plant communities and associated organic matter content (duff and soil wood) that are within the ecological capability of the site.</p>	<p><b>3)</b> Implement management activities that achieve Forest Plan standards for soil productivity, ground cover and grazing utilization. Also follow MSs 5, 7, and 29. <b>4)</b> Implement restoration treatments, which will establish conditions where soils within activity areas will make significant progress toward properly functioning conditions. Investigate and implement ecologically sound techniques for reducing detrimental soil disturbance. Also follow MSs 3, 5, 47, 55, and 61. High priority in deposition zone (LTA E), moderate in transition (LTA C), low in transport zone (LTA A, B).</p>
<p><b>Tyee Fire-Flood Risk:</b> There is an increased risk of flooding with associated threats to life and property due to the effects of the 1994 Tyee fire.</p>	<p>Vegetative ground cover is restored. Infiltration rates on hydrophobic soils are restored. Concentration of surface runoff is reduced, especially on roadways.</p>	<p><b>5)</b> Implement projects to reduce surface runoff and surface/mass erosion from disturbed sites, especially from roads and moderate-high intensity burned areas (e.g., site revegetation, log terracing, road obliteration, road surfacing, surface water control, activity avoidance, etc.). Also follow MSs 2, 3, 7, 29, 34, and 36.</p>

\*Note Management Strategies 6b, p.2-8 and 12b, p.2-10 have been added since version 2.0.

Existing Condition	Desired Condition	Management Strategies
<p><b>Critical, Unique &amp; key Species and Habitats:</b> Critical, unique &amp; key habitats for PETS, MIS, S&amp;M and unique endemic species of plants and animals occur in the analysis area. Many of these components are limited and susceptible to natural and management disturbances. The location of many of these species and habitats is unknown. Adequate condition and trend data are lacking to determine status of some of these species.</p>	<p>Critical, unique &amp; key species and habitats locations are identified, sustainable and in sufficient quality and quantity to insure species viability.</p>	<p><b>6a)</b> Identify critical/unique/key species and habitats and their limiting components. Implement management recommendations developed for Survey and Manage (S&amp;M) species where those species occur. Develop species management guides for species and habitats as needed to insure population viability to meet Forest Plan objectives. Avoid creating situations that will contribute to potential hazardous interactions between humans and wildlife. Develop Conservation Strategies and Agreements for sensitive plants as needed. Consider use of protective Forest Plan designations for some of these sites (e.g., Special Interest Areas). Also follow MSs 1, 2, 7, 15, 16, 29, 34 and 36.</p>
<p><b>Grizzly Bear/Gray Wolf:</b> Grizzly bear and gray wolf are endangered and threatened species, respectively. Habitat occurs in the watershed, but these species are not recovering. Human access and activities limit security needed for these animals to fully utilize their various seasonal habitat components.</p>	<p>Seasonal habitat components are good quality and sufficient quantity for denning, foraging, etc., and remote enough from high human activities to allow the animals the security to use these habitats without adverse interactions.</p>	<p><b>6b)</b> Reduce road densities throughout the watershed. Assess seasonal habitat distribution and needs for these species when developing roads, trails, recreation areas, and other activities. Map habitat components, assess quantity and distribution, establish standards for sufficient habitat within each Bear Management Unit, and monitor for compliance.</p>
<p><b>Road and Trail System:</b> Road and trail density is high in several subwatersheds. A high percentage of lower slope or riparian roads exists in many of these areas. The maintenance needs of the existing road system exceed annual funding levels. Poor surface water control on roadways alters hillslope hydrology and increases erosion and sedimentation. Riparian roads alter floodplain function. Dense road and trail systems increase human activities, reducing wildlife security, and limiting wildlife use in Fall, Winter and Spring.</p>	<p>The road and trail system is scaled properly to meet access needs and maintenance limitations, while reducing negative impacts to wildlife and other resources (e.g., runoff concentration and accelerated sedimentation from roads and trails is significantly reduced, especially at stream crossings). Hydrologic function is restored. Open road densities are limited in habitats where access is a management concern (e.g., mule deer winter range or near raptor nest sites).</p>	<p><b>7)</b> Continue implementation of restoration projects treating priority road-related problems. Complete and implement an Access and Travel Management (ATM) Plan that will establish season of use, road densities, closure strategies, maintenance requirements, etc. for the system. Develop ATM in concert with all ecosystem uses including recreation. (MS 16). Use trail or road closures as needed to direct recreation use away from key habitat areas and/or areas allocated to specific uses. Identify access routes used for recreation, level of use and potential conflicts with wildlife/plant habitats. Also follow MSs 2 and 5.</p>

Existing Condition	Desired Condition	Management Strategies
<p><b>Noxious Weeds:</b> Noxious weeds are present. Soil conditions and ground disturbing activities promote further spread. Decline in vegetative conditions is especially prevalent in areas with soil productivity losses (e.g., compaction, and soil disturbance/loss through accelerated erosion of sandy soils in shrub/steppe). Problems are most significant in the open vegetative conditions of the shrub/ steppe, open forest and open subalpine; whereas, roads, trails and short-term openings are a concern in the closed forest and closed subalpine.</p>	<p>Noxious weeds are absent or populations are at very low levels. Healthy stands of native vegetation retard invasion and establishment of noxious weeds and soil productivity losses are minimized.</p>	<p><b>8)</b> Develop an integrated weed management strategy for the area. Reduce the risk of infestation and spread of noxious weeds. Establish desirable, aggressive grasses and shrubs capable of restricting expansion of weeds, using natives where possible (e.g., Mud Creek meadows). Consider direct control activities on populations. Identify highly erodible, invasion-prone areas as unsuitable for livestock grazing in Allotment Management Plans, including the Columbia River Breaks. Also follow MSs 3, 7, 29, 30 and 44.</p>
<p><b>Vegetation Management:</b> Management practices have altered disturbance processes such as fire, insects and disease, allowing these processes to affect ecosystem conditions at a larger scale than occurred historically.</p>	<p>Fire, insect and disease processes are present and function at the tree, stand and small-scale landscape levels.</p>	<p><b>9)</b> Conduct vegetative management projects designed to retain these processes at appropriate scales. Also follow MSs 28-30, 46-49, 52-55 and 62-64.</p>
<p><b>Planning Coordination:</b> Coordination between the public, private landowners, land management and regulatory agencies, the Yakama Nation and the Colville Confederated Tribes and local schools on resource management issues has been limited.</p>	<p>Coordination on management issues and actions provides a role for all stakeholders in the watershed.</p>	<p><b>10)</b> Foster coordination with the public, other agencies, landowners, tribes and the Entiat community for aquatic, riparian, fire protection/suppression and recreation issues to accomplish mutual watershed goals. <b>11)</b> Expand existing public involvement and information program, focused on a shared understanding of the ecological roles of people, fire, erosion, etc. Continue active support of Columbia Breaks Fire Interpretive Center.</p>
<p><b>Inventory/Monitoring Coordination:</b> Various agencies and private citizens are collecting inventory and monitoring information on resources and management activities within the analysis area; however, coordination of these efforts is still somewhat limited.</p>	<p>Inventory and monitoring activities conducted in the drainage are well coordinated, eliminating duplication of effort, increasing quality control and improving information sharing.</p>	<p><b>12a)</b> Implement a coordinated monitoring plan targeted at priority issues and post-fire recovery, including an early warning system for storm events.</p>

Existing Condition	Desired Condition	Management Strategies
<p><b>Project Implementation on Non-Federal Lands:</b> Existing opportunities to enhance the effectiveness of watershed restoration and community development efforts through partnerships with adjacent landowners, governments and other agencies are not being fully realized. As a result, complete watershed restoration packages cannot be assembled, coordinated treatments cannot be implemented and resulting cost efficiencies are not being achieved in some areas.</p>	<p>Federal participation in watershed restoration and community development projects on non-Federal lands is increased, resulting in more rapid and efficient achievement of ecosystem goals for the entire watershed. Federal policies supporting such coordinated actions are maintained (e.g., Rural Community Development Program, Wyden Amendment authorization, USFWS Partners Program).</p>	<p><b>12b)</b> Develop and maintain working partnerships with adjacent landowners, local governments and other resource agencies that incorporate Federal participation in priority projects on non-Federal lands that achieve goals of mutual benefit to all parties (e.g., correcting a fish passage barrier downstream on private lands that restores aquatic connectivity to stream reaches upstream on NFS lands through a watershed restoration agreement).</p>
<p><b>Landscape Appearance:</b> Some of the landscape is in an altered condition as shown on the scenic condition map.</p>	<p>Landscape appears to be natural.</p>	<p><b>13)</b> Within the Tyee Fire perimeter, maintain representative mix of all 3 burn intensities for short-term scenic purposes. Also follow MS 34.  <b>14)</b> Revise the Entiat Valley Visual Corridor Plan (1978) in concert with the recreation use plan (MS 16).</p>
<p><b>Snags and Logs:</b> Within burned areas, large amounts of standing dead trees exist now in all size classes; there will likely be a shortage of snags in the future when these trees fall and before replacement trees can grow.</p>	<p>Snags and logs are present at levels meeting the ecological capacity of the site.</p>	<p><b>15)</b> Manage snags and logs based on site-specific analysis using current policies and guidelines (quantitative standards in WNF Forest Plan and NW Forest Plan in unburned areas; WNF Fire Recovery snag guidelines in Tyee Fire burned area).</p>
<p><b>Recreation Planning:</b> Conflicts exist between user groups and values. During recent years the District has experienced an increase in recreation use (sightseeing, hiking, snowmobiles, motorcycles, horseback riders, mountain bikers to name a few).</p>	<p>No conflicts between competing user groups.</p>	<p><b>16)</b> Develop a Comprehensive Recreation Use Strategy Plan linked to Access Travel and Management Plan. Discourage recreation developments near critical, unique &amp; key wildlife habitats. Use trail or road closures as needed and other management actions to direct recreation use away from key habitat areas and/or areas allocated to specific uses. Identify access routes used for dispersed recreation, level of use and potential conflicts with wildlife/plant habitats. Foster coordination with the public, other agencies, landowners, and the Entiat Community to accomplish recreation goals and address recreation issues. Follow MSs 7, 10, 11, 14 and 40.</p>

Existing Condition	Desired Condition	Management Strategies
<p><b>Developed Recreation Uses, Site Impacts:</b> Heavy use of developed campgrounds and popular trailheads has resulted in: unacceptable levels of soil disturbance (compaction, erosion); vegetation loss/removal (trampling, firewood cutting); excess noxious weed establishment; lack of down woody debris (particularly in riparian areas); and bank stability problems at localized concentrated-use points. User-built trails are a problem.</p>	<p>Natural Appearing landscape character and scenic condition. Maintained and/or improved vegetative cover. Noxious weeds are minimized. Minimize adverse impacts on soil productivity, riparian and channel conditions at developed campgrounds and popular trailheads. Minimize transfer of adverse impacts to other areas (riparian areas). Acceptable travel routes are provided through riparian areas and acceptable recreation facilities are provided.</p>	<p><b>17)</b> Vegetation management plan developed that will allow for long-term, sustainable use of the resource (Including noxious weed management). Harden high use areas with material compatible with ROS (Recreation Opportunity Spectrum). Provide structures such as hitch rails to control stock at primary horse entry points. Evaluate sites and develop a management strategy that considers site upgrades, closures/hardening of sites and trails and construction of sanitation facilities in appropriate locations. Limit vehicle access to dispersed sites. Turnpike, bridge, harden, or relocate trails to protect wet areas. Restoration of some areas as needed. Promote and educate public about use of weed-seed-free feed.</p> <p><b>18)</b> Implement a socially acceptable, developed site rehabilitation/maintenance program, to include: a) Public info about need to protect riparian vegetation and banks, b) Provide firewood and actively enforce cutting ban, c) Plant native grass/forb/tree species for ground cover and rooting, d) Provide suitable cover in high-traffic areas (chips), e) rehabilitate damaged banks and f) relocate campsites away from banks wherever feasible. Utilize the Respect the River Program as an implementation tool. Also follow MS 20.</p> <p><b>19)</b> Provide recreation stock facilities at appropriate developed recreation sites. Follow MSs 3, 8, 16, 20, 29 36, and 38.</p>
<p><b>Developed Recreation Sites, Safety Concern:</b> Dead, dying and defective trees pose a safety hazard.</p>	<p>Sites meet established standards for health and safety code.</p>	<p><b>20)</b> Manage vegetation to be compatible with human use and safety. Also follow MSs 2, 3, 34, 36 and 38.</p>



Existing Condition	Desired Condition	Management Strategies
<p><b>Dispersed Recreation Use, Site Impacts:</b> Localized detrimental soil disturbance, particularly compaction, loss of ground cover, erosion and surface water concentration, has occurred at heavily used dispersed sites; especially at alpine sites (meadows) and trail channel crossings. Heavy use of dispersed sites has resulted in unacceptable loss/removal of woody debris and vegetation (trampling, firewood cutting). Dispersed sites have inadequate sanitation facilities.</p>	<p>Natural appearing landscape character and scenic condition. Hydrologic processes are properly functioning; infiltration rate, storage capacity and release of water are restored. Minimize adverse impacts to riparian and channel conditions at dispersed sites. Minimize transfer of adverse impacts to other areas (riparian areas). Acceptable travel routes are provided through riparian areas and acceptable recreation facilities are provided. Sanitation strategies are adequate.</p>	<p><b>21)</b> Implement a socially acceptable dispersed site rehabilitation/maintenance program. Utilize the Respect the River Program as an implementation tool. Also follow MSs 2, 6, 7, 16-18, 34 and 38.  <b>22)</b> Provide recreation stock facilities within the Wilderness and at appropriate dispersed recreation sites.</p>
<p><b>Change of Viewshed - Smoke and Dust Impacts on Air quality:</b> Summertime dust from roads and trails, smoke from all types of burning, and "metro" area smog detracts from the viewing and recreation experience.</p>	<p>Natural appearing landscape character and scenic condition. Recognition that some level of smoke from natural and prescribed fire will be present at times in the process of achieving this landscape character. Human-caused levels of dust are reduced in major campgrounds and roadways. Smog reduced due to the effectiveness of regional control efforts.</p>	<p><b>23)</b> Design prescribed fire to promote maintenance of natural landscape character within smoke management constraints. Utilize burning techniques that minimize smoke production and maximize dispersal (follow Washington State Smoke Management Plan). On existing facilities (e.g., roads, campgrounds), promote frequent maintenance and use dust abatement techniques where appropriate. Incorporate dust abatement measures into the design of new facilities where appropriate. Reduce number of roads or convert to trails. Also follow MS 7.</p>
<p><b>Expectation of Quality Recreation Facilities:</b> There are a wide variety of recreation facilities at various levels of condition. In some cases the needed facilities are absent or existing sites require upgrading to meet projected use and accessibility standards.</p>	<p>Attractive, well-maintained and designed recreation facilities appropriate to the ROS class of the area are present.</p>	<p><b>24)</b> Develop a long-term strategy for the improvement and expansion of recreation facilities to accommodate the growing need where other resources can be protected. Component actions would include: a) implementation of the Recreation Facility Accessibility Survey findings, b) update of recreation facilities condition surveys through the INFRAstructure program, c) update of facility improvement priorities (Forest Plan Appendix A), and d) review and validation of current inventory of areas for potential expansion of recreation opportunities. Also follow MSs 11, 16, 18 and 40.</p>

Existing Condition	Desired Condition	Management Strategies
<p><b>Domestic-Bighorn Sheep Contacts:</b> Swakane bighorn sheep population is not growing as expected. There is a potential for disease in bighorn sheep from exposure to domestic sheep from adjacent allotments.</p>	<p>Desired population levels and areas to be managed for bighorn sheep are clearly defined.</p>	<p><b>25)</b> Develop a comprehensive bighorn sheep management plan in cooperation with WDFW and USFWS. This plan will integrate existing State and Forest plans and will extend beyond the Entiat Analysis Area. Annual operating plans will require that domestic sheep grazing will be kept within allotments.</p>
<p><b>Native Aquatic Biota:</b> Reduced native sport fish populations and altered distribution by stocking as a result of proximity of trail/road system to streams.</p>	<p>Genetic viability and variability of existing native aquatic biota are not reduced.</p>	<p><b>26)</b> Minimize/avoid streamside trails and camps. Also follow MS 7.</p>
<p><b>Pre-Attack Facilities:</b> Pre-Attack facilities such as fuel breaks and water chances exist throughout the watershed. Some are in poor condition (due to lack of past maintenance or effects of recent fires) and are causing resource damage.</p>	<p>Pre-Attack facilities are functional and are an important part of limiting effects of catastrophic fires.</p>	<p><b>27)</b> Maintain a mix of Pre-Attack facilities consistent with other resource needs and the Federal/private interface. For example, water chances constructed to maintain channel stability and fish passage.</p>

**Table 2-1. Conditions and management strategies for the Shrub/Steppe vegetative group.**

Existing Condition	Desired Condition	Management Strategies
Vegetation		
<p><b>Altered Vegetative Structure and Condition - Fire:</b> Most of area burned in Tye and Dinkelman fires resulted in loss of much of shrub component and scattered large pines. Condition of the shrub component in these recently burned areas approximates pre-settlement conditions; whereas, unburned areas have a higher percentage of shrubs (lower percentage of grass-forb) than existed prior to pre-settlement.</p>	<p>There is a mix of shrub age classes, grasses and forbs associated with scattered large pines. Native ground cover capable of resisting noxious weed expansion. Plant communities produce structurally diverse, vigorous groundcover that approaches a natural grassland condition.</p>	<p><b>28)</b> Replicate natural fire regimes, on a landscape scale, with low intensity underburns that promote fire resilient understory and fire tolerant overstory (minimize development of ladder fuel structures).  <b>29)</b> Encourage the development of native shrubs and forbs to provide a mix of vegetative composition and structure.</p>
<p><b>Altered Vegetative Structure and Condition - Grazing:</b> Altered vegetative community structure due to historic over-grazing with fire exclusion: decline of native perennials–increase of annuals and noxious weeds; decline of native mid-level shrubs, especially in riparian areas. Concentration of livestock in valley bottoms has resulted in loss of vegetation and trampling of streambanks in some areas.</p>	<p>A structurally diverse, vigorous native shrub and grassland community (natives) exists. Vegetative structure and condition in riparian areas supports fully functional riparian-channel system. Naturally appearing vegetative mosaic exists at the landscape scale.</p>	<p><b>30)</b> Manage grazing levels to maintain understory plant vigor and structure in allotments. Also follow MSs 4, 8, 28, 29, 34, 40, 44 and 64.</p>
Wildlife		
<p><b>Mule Deer Cover and Forage:</b> There are abnormally low levels of mule deer cover and forage due to the extent of recent burns.</p>	<p>Deer populations and the level of mule deer cover and forage are in balance.</p>	<p>Follow MS 29 and work with the WDFW to balance mule deer populations with available cover and forage.</p>
<p><b>Human Activities in Mule Deer Winter Range:</b> Human activities reduce habitat effectiveness of deer winter range. Concern exists that increasing levels of winter recreation in lower Entiat mule deer winter range may be causing harassment and displacement of wolves and deer from key habitat.</p>	<p>Human activities in winter are confined to corridors and have minimal impact on deer and wolves.</p>	<p><b>31)</b> Direct winter recreation use to corridors through deer winter range during access management planning and implementation. Also follow MSs 7 and 16.</p>
<p><b>Grouse Populations:</b> Sage grouse and sharp-tailed grouse are extirpated.</p>	<p>Areas to be managed and potential populations of these grouse are defined and managed under a Species Management Guide.</p>	<p><b>32)</b> Inventory habitat and potential for these species. Develop species management plans for sharp-tailed grouse and sage grouse.</p>

Existing Condition	Desired Condition	Management Strategies
<p><b>Cover for Ground-Nesting Birds:</b> Reduced vegetation height, density, and composition resulting from grazing, fire and exclusion of disturbance reduces nesting cover for ground-nesting birds. Limited quality cover exposes these birds to the elements and greater predation, resulting in lowered reproductive success.</p>	<p>Proper forage utilization maintains sufficient cover for prolific populations of ground-nesting birds.</p>	<p><b>33)</b> Promote development of more diverse structure and distribution of native shrubs and forbs over the entire landscape. Also follow MSs 6, 28 and 30.</p>
<p><b>Riparian Vegetative Structure and Condition:</b> Vegetative structure in riparian areas is poor, with low populations of low to mid-level shrubs. Riparian areas not providing wildlife habitat near their capability i.e., they are lacking the structure provided by deciduous components. Vegetative functions in buffering sediment delivery, providing shade, organic input (fines and large wood) and bank stability are degraded.</p>	<p>Vegetation structure in riparian areas approximates historic conditions and supports natural functions (diverse mix of low and mid-level shrubs, as well as deciduous trees).</p>	<p><b>34)</b> Promote all layers of vegetative structure in riparian areas (grass, forbs, low to mid-level shrubs, trees and unique habitats). Also Follow MS 2.</p>
<p><b>Unique Habitat-Columbia River Breaks:</b> The varied terrain and rocky sites in close proximity to the Columbia River add to the potential for unique habitats for plants and animals to be found within these areas. There is little current knowledge of these areas on which to draw for analysis of effects of potential management activities.</p>	<p>The areas are surveyed for better understanding of distribution of species and habitats. Information is available for proper management and analysis of potential management activities on these lands, the adjacent watersheds and within the province.</p>	<p><b>35)</b> Complete provincial-level wildlife species guild analysis. Also follow MS 6.</p>
<p>Soil/Water/Fish (also applicable to Open Forest)</p>		
<p><b>Large Woody Debris:</b> In this zone, large woody debris (both present and potential) is lacking in many streams, especially fish-bearing waters (Ref App page F-62 in Watershed Assessment Entiat Analysis Version 2.0 WNF).</p>	<p>Vegetative structure and condition in riparian areas is restored, providing for adequate recruitment of large woody debris.</p>	<p><b>36)</b> Maintain, plant or encourage large diameter native tree species in riparian reserves. Also follow MS 34.</p>
<p><b>Erosion/Sedimentation:</b> In this zone, erosion, sediment delivery and sediment storage in channels and on floodplains are all high.</p>	<p>Accelerated sedimentation is reduced from existing condition and not adversely affecting beneficial uses.</p>	<p>Follow MSs 2, 5, 7, 29 and 36.</p>

Existing Condition	Desired Condition	Management Strategies
<p><b>Riparian Road Density:</b> Road densities are high in riparian areas. These roads intercept sub-surface flows, concentrate runoff, increase sedimentation, confine channel migration and reduce security and other wildlife habitat values.</p>	<p>Riparian habitat values and floodplain function are restored.</p>	<p>Follow MSs 2, 5, 7, 34 and 36.</p>
<p><b>Stream Channels:</b> Many stream channel segments in this zone are artificially constrained and simplified by roads, development, channelization, event response structures (flood and fire rehabilitation) and other uses.</p>	<p>Stream channels are healthy and functioning within historic limits.</p>	<p><b>37)</b> Evaluate the need to remove or modify existing BAER (define) structures (check dams) following their effective lifespan. In developing rehab plans for future events, consider habitat connectivity and long-term, material transport processes at sites proposed for treatment. Major emphasis on coordinated resource management (MS 10).</p>
<p><b>Fish Habitat:</b> Rearing and holding habitat, off-channel and in-channel winter rearing habitat, spawning habitat and resident adult habitat in this zone are in fair to poor condition in all stream segments.</p>	<p>Spawning, rearing and holding habitats are at or near their natural capabilities. Habitat connectivity is present, man-made barriers to fish passage are not present.</p>	<p>Follow MS 2. Major emphasis on coordinated resource management (MS 10).</p>
<p>Scenery/ Recreation</p>		
<p><b>Landscape Appearance:</b> Landscapes are a mix of altered and natural-appearing.</p>	<p>A natural-appearing character theme and condition is present for scenic travel routes, viewsheds and recreation settings.</p>	<p><b>38)</b> Manage foreground and middle ground for scenic purposes.  <b>39)</b> Rehabilitate altered landscapes as shown on scenic condition map.  <b>40)</b> Use scenic management system for landscape aesthetics to maintain and enhance scenic resource.  <b>41)</b> Recent Decision Notices manage foreground of Potato Creek Road #5380, Baldy Mtn. Road #8410, Steliko Ridge Trail and Tyee Road # 5700 at a higher Visual Quality Objective (VQO) than Forest Plan indicates. Future actions will consider the appropriateness of continuing these VQOs given the extent of wildfire disturbance. Also follow MSs 13, 14 and 34.</p>

Existing Condition	Desired Condition	Management Strategies
<p><b>Change of Viewshed - Road Density:</b> Road density and/or locations present an altered appearing landscape. As a result of the Tyee fire, some roads are more visible because vegetative screening burned.</p>	<p>Landscape that appears more natural, roads blend in and are more subordinate to the characteristic landscape patterns. Some roads may be converted to trails. A Natural Appearing landscape character theme and scenic condition is present for scenic travel routes, viewsheds and recreation settings.</p>	<p><b>42)</b> Evaluate foreground and middleground views from major and secondary travel routes. Reduce middleground views of high-density roads in the following areas as viewed from major and secondary travel routes: Preston/Brennegan Creek, Mills Canyon/Roaring Ridge, Lower Mad River, and Chumstick. Reduce views of roading by establishing vegetative screens. Roads may be converted to trails where appropriate for all ranges of ROS classes. Also follow MSs 7, 38-41.</p>
<p><b>Change of Viewshed – U.S. Highway 97, 97A (U.S. Hwy 2) and Hwy 971 –Segment of Cascade Loop Tour:</b> Most of the viewshed is Natural Appearing, but some areas are altered through management activities in middleground areas.</p>	<p>A Natural Appearing landscape character theme and scenic condition is present for scenic travel routes, viewsheds and recreational settings.</p>	<p><b>43)</b> Manage middlegrounds for scenic purposes. Maintain/establish native vegetation in altered areas. Also follow MSs 11, 29, 38 and 40.</p>
<p><b>Range Uses</b></p>		
<p><b>Range Allotment Conditions:</b> Prior to the Tyee Fire, most upland areas in existing allotments were in fair to good condition. Valley bottoms were in poor to very poor condition. Livestock concentration in valley bottoms is a concern. Desirable perennials are being replaced by annuals and noxious weeds in shrub/steppe and open forest areas. Many range improvements were damaged or destroyed by Tyee Fire.</p>	<p>Adequate ground cover is maintained to promote infiltration and reduce surface runoff. Vegetative structure and condition in riparian areas supports fully functional riparian-channel system. A diverse and vigorous assortment of well-established perennial grasses is maintained in the uplands. Noxious weed populations are confined. Range improvements are well maintained and do not promote resource damage (e.g., valley bottom concentrations).</p>	<p><b>44)</b> Develop Allotment Management Plans that will: (a) Prioritize range improvement rehabilitation, (b) Identify and resolve grazing concerns (e.g., south slopes, weed prone areas, etc.), (c) Identify transitory range opportunities, (d) evaluate opportunities to realign pasture boundaries in more logical manner or adjust timing and (e) Identify key use areas and develop management strategy for protection, rehab, etc. Inventory range improvement conditions and develop multi-year plan to rehabilitate priority developments. Follow FP Standards for RNAÆs and sensitive species management. Use water developments to avoid negative impacts on vegetation (e.g., riparian areas, seeps and springs, sensitive areas). Also follow MSs 1, 2, 6, 8, 29, 30, 34 and 64.</p>
<p><b>Wildlife-Domestic Forage Competition:</b> Mule deer, bighorn sheep and domestic livestock compete for existing forage. The degree of competition between them is unknown.</p>	<p>Permitted grazing and wildlife forage needs are in balance with proper use of forage production.</p>	<p><b>45)</b> Analyze forage availability, refer to Forest Plan Standards and allocate forage use between mule deer, bighorn sheep, and domestic livestock appropriately. Season of use and varied grazing systems may be used to regulate forage use. Also follow MS 29.</p>

**Table 2-2. Conditions and management strategies for the Open Forest vegetative group.**

Existing Condition	Desired Condition	Management Strategies
<b>Vegetation</b>		
<b>Altered Vegetative Structure and Condition - Recent Fires:</b> Early and mid successional stages are predominant due to fires since 1970. Shrub component in understory greatly reduced due to recent fires; much of existing overstory is dead with the exception of occasional green clumps.	A mix of successional stages exists, providing a mosaic of vegetation. Grassland shrub understory with pine overstory 10 to 50% crown closure. Understory consists of 5 to 15% shrubs.	<b>46)</b> Manage to achieve vegetative conditions and fuel profiles/distributions that support low to moderate fire intensities and more natural frequency regime. <b>47)</b> Maintain sufficient snag, down wood and soil wood levels to meet soil productivity, wildlife and scenic needs. <b>48)</b> Utilize varied strategies that reduce the development of high stocking levels including prescribed fire, mechanical fuel treatment and harvest. Also follow MS 28.
<b>Altered Vegetative Structure and Condition - Unburned Areas:</b> Unburned portions of this zone have low levels of standing dead and down, high levels of standing small diameter green trees. Stocking is higher than under historic conditions and ladder fuels are high (shrub and suppressed trees). With these fuel loadings, the potential for moderate-high intensity fires is high.	Stand structures are such that the potential for high and moderate intensity fires is low. Fuel profiles are present that support low to moderate intensity fires as opposed to high intensity, stand replacing fires. Fire frequency closer to natural regime.	<b>49)</b> Maintain a wide spacing of park-like ponderosa pine. Thin smaller diameter trees to reduce densities. Maintain denser stands (protected by surrounding low fuel areas) on selected sites to meet other resource management objectives. Also follow MSs 28 and 46.
<b>Altered Vegetative Structure and Condition - Grazing:</b>		See text for MS 30.
<b>Wildlife</b>		
<b>Mule Deer Forage and Cover:</b> There is a shortage of both forage and cover areas for deer.	Clumps of coniferous trees providing cover and open foraging areas are present and well distributed.	<b>50)</b> Manage stands of thermal cover on strategically selected sustainable sites. Also follow MSs 28 and 29.
<b>Human Activities in Mule Deer Winter Range:</b>		See text for MS 31.
<b>Unique Habitat-Columbia River Breaks:</b>		See text for MS 35.
<b>Riparian Vegetative Structure and Condition:</b>		See text for MS 34.
<b>Soil/Water/Fish</b>		
<b>See Existing Condition for Shrub/Steppe.</b>	See Desired Condition for Shrub/Steppe.	See Management Strategies for Shrub/Steppe.
<b>Scenery/Recreation</b>		
<b>Landscape Appearance:</b> Some of the landscape is in an altered condition as shown on the scenic condition map.	Landscape is natural appearing.	Follow MSs 13, 14, 34, 38-41.
<b>Change of Viewshed-Road Density:</b>		See text for MS 42.
<b>Change of Viewshed - U.S. Highway 97, 97A (U.S. Highway 2) and Segment of Cascade Loop Tour:</b>		See text for MS 43.

Existing Condition	Desired Condition	Management Strategies
<p><b>Large Woody Debris (LWD) and Recreation Facilities Protection:</b> Debris jams in this zone (e.g., Mad River) have impacted recreational facilities (primarily bridges and trails).</p>	<p>Recreational facilities are located or constructed in such a way that they do not interfere with natural channel-forming processes.</p>	<p><b>51)</b> Relocate facilities where appropriate. In other situations (e.g., emergency responses), implement actions that result in retention of LWD material in existing sizes, while protecting recreation facility (e.g., winching and realignment, temporary abandonment, etc.). Also follow MSs 2 and 16.</p>
<p>Range Uses</p>		
<p>Range Allotment Conditions:</p>		<p>See text for MS 44.</p>
<p>Wildlife-Domestic Forage Competition:</p>		<p>See text for MS 45.</p>
<p>Cover for Ground-nesting Birds:</p>		<p>See text for MS 33.</p>



**Table 2-3. Conditions and management strategies for the Closed Forest vegetative group.**

Existing Condition	Desired Condition	Management Strategies
<b>Vegetation</b>		
<p><b>Successional Stages:</b> Disproportionate amounts of early successional stage exist due to large fires since 1970. Unburned portions of zone are predominantly mid-successional and higher in density than under historic conditions. Unburned, higher elevation portion of zone is providing excellent spotted owl habitat (i.e., late successional stage with multi-layered grand fir understory).</p>	<p>Areas of open grown, park-like ponderosa pine are present with interspersed mosaic of early-mid-late successional stages, as needed to meet resource requirements. For example, a mosaic of successional stages throughout the higher elevation portion of the zone (at roughly 1/3 of each structural stage) should exist for spotted owl habitat.</p>	<p><b>52)</b> In reforestation, favor ponderosa pine widely spaced in lower elevations of zone and dry sites; favor Douglas-fir over grand fir in higher elevation, mixed conifer, and moist sites.  <b>53)</b> Protect remaining green stands (late successional) and manage entire zone to achieve a mosaic of successional stages, arranged in a natural functioning and appearing mosaic (Further analysis is needed to evaluate ability to create 1/3 mosaic, especially in the short-term, within existing constraints (e.g., LSRs)).  <b>54)</b> Manage stocking levels in green stands to favor larger diameter, wider tree spacing where owl habitat is not a primary consideration (ponderosa pine in drier areas, Douglas-fir in more moist sites). Also follow MSs 15, 46, and 47.</p>
<p><b>Fuel Loading:</b> This zone contains a high density of smaller-diameter, standing dead trees. Unburned sites are also characterized by relatively high fuel loadings.</p>	<p>Fuel profiles are characteristic of low-moderate fire intensity instead of supporting high intensity, stand replacing fires. Fire frequency closer to natural regime. Defensible space is maintained around structures.</p>	<p>Follow MSs 46 and 47.</p>
<p><b>Large Diameter Trees:</b> There is a shortage of large diameter trees (&gt; 20 inches dbh) due to past fires or timber harvest in the unburned portions of zone. Those present have low levels of cavities suitable for wildlife.</p>	<p>Large trees are present, many having defect characteristics that support cavity development.</p>	<p><b>55)</b> Maintain existing and favor growing large diameter trees. Also follow MSs 54 and 58.</p>
<b>Wildlife</b>		
<p><b>Carnivore Habitat Limitations:</b> Habitat is limited for native species such as fisher, wolverine, marten and lynx.</p>	<p>Native animal species are present Habitat supports viable population levels. Road densities &lt; 1 mile per sq mi.</p>	<p><b>56)</b> Maintain high density down wood concentrations for native species. Also follow MSs 7 and 53 within existing constraints (e.g., LSRs).</p>
<p><b>Human Activities in Mule Deer Winter Range:</b></p>		<p>See Text for MS 31.</p>
<b>Soil/Water/Fish</b>		
<p><b>Existing Debris Slides:</b> Debris slides and channels have formed as a result of fire-flood events.</p>	<p>Old debris channels are undisturbed; surface runoff is not concentrated as a result of human activity. Channels and riparian corridors are in a condition to accommodate natural hillslope functions.</p>	<p><b>57)</b> Avoid road locations or other management disturbances in and tributary to old debris channels and in areas of high mass wasting hazard.</p>

Existing Condition	Desired Condition	Management Strategies
<p><b>Large Woody Debris (LWD):</b> Approximately 50% of surveyed stream reaches in this zone do not meet Forest Plan standards for large woody debris.</p>	<p>LWD is present at Forest Plan standards in all stream reaches. Debris jams and step pool profiles approximate historic conditions. LWD recruitment is at the appropriate, sustainable level for the vegetative type and site conditions.</p>	<p><b>58)</b> Avoid removal of trees larger than 20 inches dbh from riparian reserves. (especially on class I to III waters).</p> <p><b>59)</b> Where appropriate, change Forest Plan standards to be in line with natural capability. Also follow MSs 2 and 36.</p>
<p><b>Primary Pools:</b> Less than 25% of surveyed stream reaches have large pools that meet Forest Plan standards.</p>	<p>Deep pools exist that meet Forest Plan standards with adequate cover and well vegetated banks.</p>	<p>Follow MSs 2, 34, 36, 58 and 59.</p>
<p><b>Aquatic Habitat Diversity:</b> Riffle habitat dominates most reaches, but diversity is provided by small pools formed by large woody debris.</p>	<p>Habitat complexity provides for all life stages of all native aquatic species.</p>	<p>Follow MSs 2, 34 and 59.</p>
Scenery/Recreation		
<p><b>Landscape Appearance:</b> The zone consists of a mix of natural appearing and altered landscapes.</p>	<p>Landscapes are natural appearing and consist of a diverse composition of plants and age classes including large (&gt; 20 inch dbh) trees.</p>	<p><b>60)</b> Re-establish and/or maintain western larch where adapted and appropriate. Also follow MSs 13, 14, 38-41, 53 and 55.</p>
<p><b>Change of Viewshed - Road Density:</b></p>		<p>See text for MS 42.</p>
<p><b>Recreation Facilities Protection:</b></p>		<p>See text for MS 51.</p>
Range Uses		
<p><b>Range Allotment Conditions:</b></p>		<p>See text for MS 44.</p>
<p><b>Wildlife-Domestic Forage Competition:</b></p>		<p>See text for MS 45.</p>
<p><b>Cover for Ground-Nesting Birds:</b></p>		<p>See text for MS 33.</p>

**Table 2-4. Conditions and management strategies for Closed Subalpine vegetative group.**

Existing Condition	Desired Condition	Management Strategies
<b>Vegetation</b>		
<b>Successional Stage:</b> Vegetation is predominantly mid and late successional stage with mid successional often comprised of mature lodgepole pine overstory. In such cases stands are typically dense with > 1000 stems per acre. High numbers of snags and down woody debris < 20 inches dbh.	Zone is made up of a mosaic of vegetative conditions with most stands in mid-late stage.	Follow MS 53 to favor lynx habitat where appropriate.
<b>Wildlife</b>		
<b>Carnivore Habitat Limitations:</b>		See text for MS 56.
<b>Soil/Water/Fish (Also applies to Open Subalpine)</b>		
<b>Groundwater Interception:</b> Management activities, primarily roads, have intercepted near-surface groundwater, especially in the Cougar and Lake Creek areas (LTAs C and B).	Subsurface flow interception and runoff concentration from existing facilities is reduced. Additional disruptions of near-surface groundwater movement are minimized.	<b>61)</b> Existing and planned road and trail locations and drainage structures need to be improved/ planned to account for high levels of near surface groundwater storage and flow in these soils. Also follow MSs 5 and 7.
<b>Stream Channel Confinement:</b> Some stream channel segments are constrained by roads and riparian function (sediment buffering) is impaired.	Floodplains are fully functional and streamflows are well regulated over the entire year. Maximize storage of subsurface flows as near surface ground water.	Follow MSs 2-4, 7, 34 and 61.
<b>Primary Pools:</b> Less than 25% of surveyed stream reaches meet Forest Plan standards for primary pools.	Pools exist within the ecological capability of the site. In this case pool occurrence is partially limited by high gradient reaches. Existing Forest Plan standards are not achievable.	Follow MS 59.
<b>Fish Habitat Condition:</b> Rearing and holding habitat, off-channel winter rearing habitat, in-channel winter rearing habitat and spawning habitat are in fair to good condition.	Substrate fines are acceptable for bull trout spawning and other aquatic organisms (<20% fines of <1.0mm diameter).	Follow MSs 2, 5, 34 and 36.
<b>Scenery/Recreation</b>		
<b>Landscape Appearance:</b> Natural Appearing landscape.	Natural Appearing landscape.	Follow MSs 38, 40 and 41.

**Table 2-5. Conditions and management strategies for the Open Subalpine vegetative group.**

<b>Existing Condition</b>	<b>Desired Condition</b>	<b>Management Strategies</b>
<b>Vegetation</b>		
<b>Meadow Succession:</b> Some conifer encroachment of meadows exists, forested areas are mostly late successional. Encroachment is escalating in some "significant" meadows that provide special recreation experiences. They are special places for people.	There is a naturally appearing mosaic of meadows and conifer patches.	<b>62)</b> Inventory, analyze and evaluate site-specific conditions and develop integrated meadow plan. Identify conditions that maintained meadows naturally and how to best restore desired openings. Implement restoration of "significant" meadows with low intensity underburns or mechanical/manual treatments to retard or reverse conifer encroachment. Emphasize appropriate fire suppression response while considering maintaining a natural appearing vegetative mosaic. Also follow MS 11.
<b>Whitebark Pine:</b> Whitebark pine is infested with blister rust.	Healthy whitebark pine is an important component of forested landscape, providing food and cover for a variety of birds and mammals.	<b>63)</b> Evaluate appropriate options for preserving WB pine stands through disease resistant stock (genetic resistance to blister rust). Also follow MS 62.
<b>Sheep Grazing Effects:</b> Past sheep grazing has caused vegetative changes including more bare areas and reduced forb component.	Meadows and open areas consist of 4-inch to 12-inch mix of shrubs forbs and grasses. Meadows occupy their historic niche.	<b>64)</b> Complete limit of acceptable change analysis and include assessment of past sheep grazing. Implement restoration work as appropriate.
<b>Wildlife</b>		
<b>Grazing effects:</b> Zone consists of a mixture of meadows, forested clumps and non-vegetated rocky areas. There are localized impacts from past grazing and human use.	Natural characteristics of open subalpine landscape.	Maintain existing condition. Restore sites of localized impacts where feasible. Also follow MSs 29 and 62.
<b>Soil/Water/Fish</b>		
<b>See Existing Conditions for Closed Subalpine.</b>	See Existing Conditions for Closed Subalpine.	See Management Strategies for Closed Subalpine.
<b>Scenery/Recreation</b>		
<b>Landscape Appearance:</b> Natural Appearing landscape.	Natural Appearing landscape.	Follow MS 62 to maintain natural appearing conditions.

## APPENDIX C - CHAPTER 173-546 WAC

### WATER RESOURCES MANAGEMENT PROGRAM—ENTIAT RIVER BASIN WATER RESOURCE INVENTORY AREA (WRIA) 46

**WAC 173-546-010 General provisions—Authority and applicability.** (1) This chapter is adopted under the authority of the Watershed Planning Act (chapter 90.82 RCW), Water Resources Act of 1971 (chapter 90.54 RCW), Minimum Water Flows and Levels Act (chapter 90.22 RCW), Water resource management (chapter 90.42 RCW), Regulation of public ground waters (chapter 90.44 RCW) and the Water resources management program rule (chapter 173-500 WAC).

(2) This chapter, including any subsequent additions and amendments, applies to all surface waters in the Entiat River basin, and all ground water hydraulically connected with those surface waters.

(3) This chapter shall not affect existing water rights, including perfected riparian rights, federal Indian and non-Indian reserved rights, or other appropriative rights existing on the effective date of this chapter, unless otherwise provided for in the conditions of the water right in question.

(4) This chapter does not limit the department's authority to establish flow requirements or conditions under other laws, including hydropower licensing under RCW 90.48.260.

**WAC 173-546-020 Purpose.** (1) In enacting this chapter, the department uses the Entiat watershed plan as the framework for making future water resource decisions for the Entiat watershed, per RCW 90.82.130. The plan recommendations were approved by the Entiat watershed planning unit, a group composed of a broad base of water use interests, and also by Chelan County officials. The plan recommendations are therefore considered an expression of the public interest.

(2) The chapter creates a reservation for future uses that is senior to the instream flows set in WAC 173-546-050.

(3) This chapter sets forth the department's policies to guide the protection, use and management of Entiat River basin surface water and interrelated ground water resources. It protects existing water rights, establishes instream flows, and sets forth a program for the administration of future water allocation and use.

(4) The purpose of this chapter is to retain perennial rivers, streams, and lakes in the Entiat River basin with the instream flows and levels necessary to protect and preserve wildlife, fish, scenic, aesthetic, recreation, water quality and other environmental values, navigational values, and stock watering requirements.

**WAC 173-546-030 Definitions.** For the purposes of this chapter, the following definitions shall be used:

(1) "**Allocation**" means the designation of specific amounts of water for specific beneficial uses.

(2) "**Appropriation**" means the process of legally acquiring the right to specific amounts of water for beneficial uses, as consistent with the requirements of the ground and surface water codes and other applicable water resource statutes.

(3) "**Beneficial uses**" means uses of water for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, recreational, thermal power production, and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state.

(4) "**Commercial agriculture**" means uses related to commercial orchards and vineyards, and commercial livestock and farming operations.

(5) "**Commercial/light industrial**" means a water supply for use by small businesses and commercial users. It also refers to the "value added" uses associated with agriculture, as defined by

the Chelan County Code, Ch. 11.04.010, or any subsequent amendments. A "value added operation" means any activity or process that allows farmers to retain ownership and that alters the original agricultural product or commodity for the purpose of gaining a marketing advantage. Value added operations may include bagging, packaging, bundling, precutting, etc.

(6) "**Consumptive use**" means a use of water that reduces the amount of water in the water source.

(7) "**Department**" means the Washington state department of ecology.

(8) "**Domestic water use**" means, for the purposes of this chapter, use of water associated with human health and welfare requirements, including water used for drinking, bathing, sanitary purposes, cooking, laundering, irrigation of not over one-half acre of lawn or garden per dwelling, and other incidental household uses. Stock watering is also included in this category. Stock watering uses must be consistent with the Chelan County Code, Section 11.88.030 or any subsequent amendments. It does not apply to feed lots and other activities which are not related to normal grazing land uses.

(9) "**Existing water right**" includes perfected riparian rights, federal Indian and non-Indian reserved rights or other appropriative rights.

(10) "**Hydraulic continuity**" means the interrelation between ground water (water beneath land surfaces or surface water bodies) and surface water (water above ground, such as lakes and streams).

(11) "**Instream flow**" as used in this chapter, has the same meaning as a minimum instream flow under chapter 90.82 RCW, a base flow under chapter 90.54 RCW, a minimum flow under chapter 90.03 or 90.22 RCW and an administrative flow in the Entiat watershed plan.

(12) "**Nonconsumptive use**" means a use of water that does not reduce the amount of water in the water source.

(13) "**Plan**" or "**watershed plan**" means the Entiat water resource inventory area (WRIA) management plan, approved by the Entiat WRIA planning unit on May 17, 2004, and by the Chelan County commissioners on September 13, 2004.

(14) "**Planning unit**" means the Entiat water resource inventory area (WRIA) planning unit (EWPU), or a successor which is mutually agreed upon by the EWPU. The planning unit was established in 1998 in accordance with chapter 90.82 RCW, Watershed Planning Act. The EWPU presently consists of the landowner steering committee, technical assistance group, and other interested stakeholders.

(15) "**Public water system**" means any system providing water for human consumption through pipes or other constructed conveyances, excluding a system serving only one single-family residence and a system with four or fewer connections all of which serve residences on the same farm. (Consistent with WAC 246-290-020; any subsequent amendments to WAC 246-290-020 will be incorporated by reference.)

(16) "**Reservation**" means an allocation of water set aside for future domestic, stock watering, agricultural, commercial and industrial beneficial uses. For the purposes of this chapter, the priority date of the reservation is senior to the instream flows set in WAC 173-546-050. "Reservation" is the same as "reserved water" in the Entiat WRIA management plan.

(17) "**Stream management unit**" means a stream segment, reach, or tributary used to describe the part of the relevant stream to which a particular use, action, instream flow level or reserve of water applies. Each of these units contains a control station. A map of the control points is included in this chapter (WAC 173-546-150).

(18) "**Withdrawal**" means the appropriation or use of ground water or surface water.

(19) "**WRIA**" means water resource inventory area. This term can be used interchangeably with "basin" and "watershed."

**WAC 173-546-040 Establishment of stream management units.** The department hereby establishes the following stream management units. The boundaries of the management units are shown on the map in WAC 173-546-150.

**Stream Management Unit Information**

Stream Management Unit Name Control Station Gauge #	Control Station by River Mile (RM); Section, Township and Range; Latitude (Lat.) and Longitude (Long.); Hydrologic Unit Code (HUC)	Stream Management Reach Description
USGS Gauge #12452990 Entiat River near Entiat, WA. ("Keystone Gauge") (Lower Entiat)	River Mile 1.4	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.
	Sec. 18, T.25 N., R.21 E.W.M.	
	Lat. 47°39'48"	
	Long. 120°14'58" NAD 27	
	HUC 17020010	
USGS Gauge #12452800 Entiat River near Ardenvoir, WA (Upper Entiat)	River Mile 18	From the terminal glacial moraine at RM 16.2, to the Entiat River headwaters, including all tributaries.
	Sec. 27, T.27 N., R.19 E.W.M.	
	Lat. 47°49'07"	
	Long. 120°25'19" NAD 27	
	HUC 17020010	
USGS Gauge #12452890, Mad River at Ardenvoir	River Mile 0.35	From the confluence of the Mad River with the Entiat River to the Mad River headwaters.
	Sec.19, T.26, R.20 E.W.M.	
	Lat. 47°44'13"	
	Long. 120°22'03" NAD 27	
	HUC 17020010	

**WAC 173-546-050 Establishment of instream flows.** (1) The instream flows established in this chapter are based on the recommendations of the Entiat planning unit and public input received during the rule-making process. These instream flows are established in accordance with RCW 90.82.080, and are necessary to meet the water resource management and ecosystem maintenance objectives of the Entiat watershed plan. Instream flows can serve to protect senior water rights.

(2) Instream flows established in this chapter protect stream flows from future withdrawals, and preserve flow levels that are necessary to protect wildlife, fish, water quality, scenic, aesthetic and other environmental values, navigational values, and stock watering requirements. In addition to protecting instream resources, instream flows serve to protect senior water rights.

(3) Instream flows established here are water rights. In accordance with RCW 90.82.080 (2)(a), the planning unit determined by unanimous vote that the priority date of the instream flows is the effective date of this chapter.

(4) All water rights established after the priority date of the instream flows, and not covered under the reservation, are expressly subject to these instream flows. Water rights junior to the instream flow may be exercised when flow or ground water conditions will provide enough water to satisfy senior rights, including the instream flows. Withdrawals of water which would conflict with instream flows shall be authorized only in situations where it is clear that the overriding considerations of the public interest will be served.

(5) The reservation of water established in WAC 173-546-070 will have a priority date senior to the instream flows. Full use of the reservation will not diminish the protective levels established by the instream flows in WAC 173-546-050, and is necessary to meet the water resource management and ecosystem maintenance objectives under chapters 90.82 and 90.54 RCW.

(6) Instream flows are expressed in cubic feet per second (cfs). Instream flows are measured at the control stations identified in WAC 173-546-040.

(7) Instream flows are established for the stream management units in WAC 173-546-040, as follows:

**Instream Flows in the Entiat River Basin**  
(cubic feet per second)

Month	Days	#12452990	#12452800	#12452890
		Lower Entiat	Upper Entiat	Mad River
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

**WAC 173-546-060 Lakes and ponds.** In accordance with RCW 90.54.020(3), lakes and ponds in the Entiat watershed shall be retained substantially in their natural condition, including those in the Wenatchee National Forest.

**WAC 173-546-070 Reservation of water for specific future uses.** (1) Using the watershed plan as a primary expression of public interest, and consistent with the authority under RCW 90.54.050(1) and 90.82.130(4), the department determines that there is water available, and hereby reserves an amount of surface and ground water, up to five cubic feet per second (5 cfs), for specific future beneficial uses.

(a) The priority date for uses under the reservation is the effective date of this chapter.

(b) The reservation is not subject to the instream flows established in WAC 173-546-050.

(c) Beneficial uses eligible for the reservation include domestic, stock watering, commercial agriculture, and commercial/light industrial uses, consistent with the recommendations of the planning unit and the framework established by the Entiat watershed plan. The 5 cfs of reserved water use will be monitored at the USGS Gauge No. 12452990 (Entiat near Entiat, river mile 1.4), identified in the watershed plan as the "Keystone" gauge. Allocation of water from the reservation will be made as follows.

(2) Domestic and stock watering. The department may allocate up to 1 cfs for these uses. This amount is available for appropriation anywhere within the Entiat River basin.

(a) Outdoor irrigation. The department may allocate water for up to one-half acre of lawn or noncommercial garden from the domestic and stock watering reserve.

(3) Commercial agriculture. The department may allocate up to 3 cfs for these uses. This amount is available for appropriation only in the Lower Entiat stream management unit as identified in WAC 173-546-040, generally being within the lower 16.2 river miles of the Entiat River watershed, and downstream of the area known as the "Stillwater" reach.

(4) Commercial and light industrial uses. The department may allocate up to 1 cfs for these uses. This amount is available for appropriation only in the Lower Entiat stream management unit as identified in WAC 173-546-040, generally being within the lower 16.2 river miles of the Entiat River watershed, and downstream of the area known as the "Stillwater" reach.

(5) A water right permit issued from the reserve must be consistent with the requirements of RCW 90.03.290.

(6) All water uses from the reserve must be implemented using water use efficiency and conservation practices, consistent with the watershed plan.

(7) This reservation of water shall only be put to beneficial use within the stream management units defined by this chapter. Applications for the withdrawal of water for purposes outside of the stream management units defined in this chapter shall be denied by the department.

(8) A record of all withdrawals from the reservation shall be maintained by the department. For accounting purposes, the department shall use the assumptions and estimates outlined in the plan, which include:

(a) In-house domestic uses: A per capita net use of thirty-five gallons per day.

(b) Outdoor irrigation shall be consistent with the guidelines in Tables 4-14 and 4-15 (below), and with other relevant information as it becomes available.

(c) Commercial agriculture: The consumptive amount of the beneficial use shall be consistent with the crop irrigation requirement specified in Tables 4-14 and 4-15 (below), and with other relevant information as it becomes available. The consumptive amount shall also be consistent, when appropriate, with any amount of conveyance water made unavailable to the river through irrigation bypass.

**Table 4-14. Monthly tree water use<sup>1</sup>(ac-in) at WSU Tree Fruit Research Center, 1972-2002.**

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT <sup>2</sup>	SEASON TOTAL
1972	2.03	5.18	7.47	9.20	8.03	4.43	2.00	38.34
1973	2.28	5.40	9.22	11.48	9.80	4.60	2.00	44.78
1974	1.74	4.57	8.69	9.21	8.95	5.21	2.00	40.37
1975	1.72	5.26	8.33	10.49	8.88	4.66	2.00	41.34
1976	1.84	2.82	7.86	10.04	6.71	4.84	2.00	36.11
1977	1.69	4.49	6.67	8.32	5.43	4.32	2.00	32.92
1978	1.92	5.18	8.07	10.20	8.25	4.63	2.00	40.25
1979	2.10	3.78	8.11	9.45	8.31	3.28	2.00	37.03
1980	1.66	4.52	6.25	9.72	7.06	3.61	2.00	34.82
1981	1.61	4.26	6.19	8.53	7.63	3.76	2.00	33.98
1982	1.61	4.60	7.18	8.06	6.74	3.22	2.00	33.41
1983	1.44	5.20	6.66	7.18	6.53	3.89	2.00	32.90
1984	1.47	3.92	6.42	9.86	7.89	3.26	2.00	34.82
1985	1.72	5.18	8.34	10.71	7.93	3.13	2.00	39.01
1986	1.74	4.65	7.69	8.56	7.97	4.08	2.00	36.69
1987	1.88	4.75	7.30	8.28	8.09	4.46	2.00	36.76
1988	1.56	4.22	6.38	10.06	7.57	4.16	2.00	35.95
1989	1.79	4.47	7.65	9.40	7.13	4.43	2.00	36.87
1990	1.78	3.91	6.69	9.39	6.83	4.55	2.00	35.15
1991	1.87	4.21	6.41	10.00	7.42	4.48	2.00	36.39
1992	2.08	6.34	8.58	8.75	7.65	4.22	2.00	39.62
1993	1.10	4.75	6.36	7.46	7.20	3.90	2.00	32.77
1994	1.69	4.74	8.23	12.41	8.53	4.67	2.00	42.27
1995	1.47	5.28	7.90	10.52	7.90	4.66	2.00	39.73
1996	1.53	4.34	8.54	11.02	9.58	4.65	2.00	41.66
1997	1.14	4.27	7.22	9.16	7.30	3.48	2.00	34.57
1998	1.49	3.66	7.81	9.52	8.29	4.75	2.00	37.52
1999	1.60	4.57	8.03	9.31	7.26	4.00	2.00	36.77
2000	1.65	4.38	8.02	9.85	8.56	3.66	2.00	38.12
2001	1.39	4.98	7.06	10.23	7.65	4.35	2.00	37.66
2002	1.49	4.12	7.69	9.83	7.82	3.81	2.00	36.76
<b>MO. AVG. SINCE 1972</b>	1.68	4.58	7.52	9.55	7.77	4.17	2.00	37.27 ac-in

1. Data have already been adjusted using pan evaporation & KC value to approximate orchard tree water use.
  2. The October value of 2 acre-inches was estimated based on miscellaneous October measurements provided by the WSU Tree Fruit Research Center, and conversations with Tim Smith, WSU Cooperative Extension. April through September values are based on data collected by T. Smith.
- .\* Note: Actual irrigation rates must be 10 to 40% higher than tree use, depending on irrigation efficiency

(This table is from the watershed plan, based on the *State of Washington Irrigation Guide* and supplemented by Washington State Tree Fruit Research data collected in Wenatchee WA.)

**Table 4-15. Average monthly tree and pasture/turf irrigation water use (ac-in) estimates.**

Description of Value	Apr	May	Jun	Jul	Aug	Sep	Oct	Season (ac-in)
Average tree fruit water use by month, based on 1972-2002 WSU data.	1.68	4.58	7.52	9.55	7.77	4.17	2.00	37.27
Average tree water use by month, with 65% application efficiency.	2.58	7.05	11.57	14.69	11.95	6.42	3.08	57.34
Average Pasture/Turf water use by month (85% of WSU tree fruit water use avg. value).	1.43	3.89	6.39	8.12	6.60	3.54	1.70	31.68
Average Pasture/Turf water use by month, with 65% efficiency.	2.20	5.99	9.83	12.49	10.16	5.45	2.62	48.74

(This table is from the watershed plan, based on the *State of Washington Irrigation Guide* and supplemented by Washington State Tree Fruit Research data collected in Wenatchee WA.)

(d) Commercial and light industrial: The consumptive amount shall be the amount needed for the specific purpose, as determined by the department and/or the Chelan-Douglas health district.

(9) Since all uses from the reserve will have the same priority date, the following will guide water supply decisions in times of water shortage:

(a) Among the three use categories: Domestic and stock-watering uses will be met first, followed by commercial agriculture and finally commercial/light industrial.

(b) Within each use category, the date of first beneficial use will be used. The use with the earliest date will be satisfied first.

(10) The reservation is created in the context of the year 2025 planning horizon of the watershed plan. Future water supplies may also be available concurrently, using alternative water sources such as storage, reuse and conservation (WAC 173-546-100).

(11) The reservation will be evaluated by the department and the Entiat planning unit no less than every five years: 2010, 2015, and 2020. The allocated and unallocated amounts for each use will be reviewed, as well as the allocated and unallocated amounts for the entire reserve. Modifications to the program may therefore be implemented by rule, if needed.

(12) The department shall notify both Chelan County and the planning unit or its successor, in writing, when it determines that fifty percent, seventy-five percent, and one hundred percent, respectively, of the reservation is allocated. The department shall also issue a public notice in a newspaper of general circulation for the region at the same three junctures.

(13) The department shall require metering and reporting for permitted surface and ground water allocations from the reservation. If more accurate water use data is needed the department may, after consulting with the EWPU (or its successor) and Chelan County, require metering and

reporting for ground water withdrawals otherwise exempted from permit requirements under RCW 90.44.050. Public water system providers will be required to meter.

**WAC 173-546-080 Maximum future allocation.** (1)(a) The department determines that there are certain times when there are surface waters above the instream flows, referred to as "high flows." These high flows provide critical ecological functions such as channel and riparian zone maintenance, flushing of sediments, and fish migration. In order to protect the frequency and duration of these higher flows, the department hereby establishes maximum amounts of water/flow that can be withdrawn from specific streams at specific times above the instream flow levels.

(b) A maximum allocation shall be used to review future applications for beneficial uses from the mainstem Entiat and Mad rivers for the periods and in the amounts specified below:

(i) The maximum allocation from May 1 - June 30 is 100 cfs. Of that 100 cfs, 25 cfs may be allocated from the Mad River.

(ii) For the period of July 1-15, the maximum allocation is 67 cfs from the mainstem Entiat only.

(iii) For the period of April 16-30, the maximum allocation is 25 cfs from the Mad River only.

(iv) For the periods during which it is clear that no water is likely to be available above the instream flows, no maximum allocation amount is indicated.

**Maximum Future Allocation, Entiat River Basin**

Month	Days	Total Maximum Allocation, Mainstem Entiat (in cfs). Measured at USGS Gauge #12452990	Portion of Maximum Allocation Available From Mad River (in cfs). Measured at USGS Gauge #12452890
January	1-31		
February	1-29		
March	1-31		
April	1-15		
	16-30		25
May	1-15	100	25
	16-31	100	25
June	1-15	100	25
	16-30	100	25
July	1-15	67	
	16-31		
August	1-31		
September	1-30		
October	1-31		
November	1-30		
December	1-31		

(2) The designation of a maximum allocation does not constitute a determination that water is available, as defined in RCW 90.03.290. A determination of water availability requires the application of four tests: Water is available; the use will not impair senior rights; water will be put to beneficial use; and the use is not detrimental to the public interest. Establishment of a water right from the allocation occurs after proper authorization from the department and after the water is first put to beneficial use. The water rights are subject to the instream flows established in WAC 173-546-050, and other provisions established in statutory, administrative and case law.

(3) The department shall require the metering and reporting of all permitted surface and ground water withdrawals from the maximum allocation.

(4) The department will maintain a record of the amount of water allocated from the Entiat and Mad Rivers. If the maximum amounts are fully appropriated, the department shall notify Chelan County and the planning unit or its successor, in writing. The department shall also issue a public notice in a newspaper of general circulation for the region.

**WAC 173-546-090 Future permitting actions.** (1) Surface and ground water permits not subject to the instream flows established in WAC 173-546-050 may be issued if:

(a) The proposed use is nonconsumptive, and compatible with the intent of this chapter.

(b) The water use qualifies for the reservation established in WAC 173-546-070.

(2)(a) Future applications for surface waters that are not part of the reserve established in WAC 173-546-070 may be approved subject to the instream flows established in WAC 173-546-050 and the maximum water allocation limits established in WAC 173-546-080.

(b) Future applications for ground waters that are not part of the reservation established in WAC 173-546-070 may be approved subject to the instream flows established in WAC 173-546-050 and the maximum water allocation limits established in WAC 173-546-080. Based upon the findings in the watershed plan, the department determines that there is hydraulic continuity between surface water and ground water sources within both the Lower and Upper Entiat River management units established in WAC 173-546-040. Therefore, water rights shall be issued for ground water only if the department determines that the withdrawal of ground water with proposed mitigation in place would not interfere with or impair the instream flows or the maximum water allocation.

(3) No right to withdraw or store the public surface or ground waters of the Entiat River basin that conflict with the provisions of this chapter will hereafter be granted, except in cases where such rights will clearly serve overriding considerations of the public interest, as stated in RCW 90.54.020 (3)(a).

(4) All future surface and ground water permit holders shall be required to install and maintain measuring devices and report the data to the department in accordance with permit requirements. In addition, the department may require the permit holder to monitor stream flows and ground water levels.

**WAC 173-546-100 Alternative sources of water.** (1) The legislature, in enacting chapter 90.82 RCW, required that strategies for increasing water supplies must be developed as part of the watershed plans. Such strategies may also be implemented through the watershed planning process. WAC 173-546-070 provides a limited reservation of water for specific new uses in the Entiat River basin. However, the ongoing need for reliable sources of new water continues. This need dictates the continued development and use of alternative sources of water, such as:

- . Multipurpose water storage facilities;
- . Conservation and efficiency measures applied to existing uses and the transfer of saved water; and
- . Acquisition, leasing, establishment of a trust water rights program (including water banking).

(2) Alternative sources of water of equal or better quality than the proposed source can be used to improve stream flows for fish, offset impacts of withdrawals on stream flows and provide sources of water for future out-of-stream uses.

**WAC 173-546-110 Future changes and transfers.** No changes to, or transfers of, existing surface and ground water rights in the Entiat River basin shall hereafter be granted if they conflict with the purpose of this chapter. Any change or transfer proposal can be approved only if there is a finding that existing rights, including the instream flows established in WAC 173-546-050, will not be impaired.

**WAC 173-546-120 Compliance and enforcement.** (1) To obtain compliance with this chapter the department, with assistance from Chelan County, the planning unit or its successor and partners, shall prepare and distribute technical and educational information regarding the scope and requirements of this chapter to the public. This is intended to assist the public in complying with the requirements of their water rights and applicable water laws.

(2) When the department determines that a violation has occurred, it shall first attempt to achieve voluntary compliance. An approach to achieving this is to offer information and technical assistance to the person, in writing, identifying one or more means to accomplish the person's purposes within the framework of the law.

(3) To obtain compliance and enforce this chapter, the department may impose such sanctions as appropriate under authorities vested in it, including, but not limited to, issuing regulatory orders under RCW 43.27A.190; and imposing civil penalties under RCW 43.83B.336, 90.03.400, 90.03.410, 90.03.600, 90.44.120 and 90.44.130.

**WAC 173-546-130 Appeals.** All final written decisions of the department pertaining to permits, regulatory orders, and related decisions made pursuant to this chapter can be subject to review by the pollution control hearings board in accordance with chapter 43.21B RCW.

**WAC 173-546-140 Regulation review.** Review of this chapter may be initiated by the department whenever significant new information is available, a significant change in conditions occurs, statutory changes are enacted that are determined by the department to require review of the chapter, or if modifications are necessary based on the review described in WAC 173-546-070. Chelan County, the planning unit, or other interested citizens with standing may request that the department initiate a review at any time. If the department initiates a review, it will consult with Chelan County and the planning unit or its successor. If necessary, the department will modify the appropriate provisions of this chapter by rule.

The reservation will be evaluated by the department and the Entiat planning unit no less than every five years: 2010, 2015, and 2020. The allocated and unallocated amounts for each use will be reviewed, as well as the allocated and unallocated amounts for the entire reserve. Modifications to the program may therefore be implemented by rule, if needed.

**WAC 173-546-150 Map.** For the purposes of administering this chapter, the boundaries of the Entiat River basin identified in the figure below are presumed to accurately reflect the basin hydrology.



# WRIA 46 Stream Management Unit: Control Points





APPENDIX D - IMPLEMENTATION PLAN FOR CHAPTER 173-546



WASHINGTON STATE  
DEPARTMENT OF  
ECOLOGY

IMPLEMENTATION PLAN FOR THE ADOPTION OF  
Chapter 173 - 546 WAC,  
Water Resources Management Program,  
Entiat River Basin,  
Water Resource Inventory Area (WRIA) 46

# 05-11-019

## Implementation Plan for Chapter 173 - 546 WAC, Water Resources Management Program, Entiat River Basin, Water Resource Inventory Area (WRIA) 46

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This rule has 4 main elements. There are some implementation needs that will be relevant to all of them (primarily outreach and communication), and each element will also have specific requirements. The main elements of the rule are:

1. Setting instream flows.
2. Establishing a reservation of water for future out-of-stream uses and the conditions associated with each use. The reservation is limited to a total of 5 cfs of surface and ground water, to be allocated between 3 categories of use: domestic and stock-watering (1 cfs), commercial agriculture (3 cfs) and commercial and light industrial uses (1 cfs).
3. Setting maximum future allocation amounts for the mainstem Entiat and Mad Rivers.
4. Addressing future permitting actions.

**1. Please describe how the Agency intends to implement and enforce the rule. Please include a description of the resources the Agency intends to use (RCW 34.05.328(3)(a)).**

Implementation consists of education and outreach, technical assistance, permitting, and enforcement. These activities will be accomplished primarily at the regional level. Enforcement under WAC 173-546 will follow the procedures developed for and used in the Okanogan, Methow, and Wenatchee River watersheds (see WAC 173-549, WAC 173-548, and WAC 173-545 respectively).

Water Resources staff are currently developing a program-wide compliance and enforcement strategy addressing instream flows

Instream flows:

- Key implementation component: outreach and communication. Outreach and communication will be done both by Ecology and by the Entiat WRIA Planning Unit (EWPU), emphasizing that flows are set and will not affect existing rights or rights established through the reservation. Rights established outside of the reservation will be subordinate to instream flows as a condition of the water right permit. When the adopted instream flows are projected not to be met in any water year, Ecology will send a letter to each right-holder with a permit or certificate conditioned with the instream flow provision. If flows fall below the instream flow level, orders will be issued to require that water users follow directions available through a toll-free telephone message, and on-the ground verification that use has been curtailed will be done by Ecology staff.
- Processing pending water right applications: applications for water uses that do not qualify for the reservation will either be denied or made subject to the adopted instream flows and maximum allocation limits.
- As described above, if water rights are issued subject to instream flow, and flows are not met, a compliance program similar to those being used in the Okanogan, Wenatchee and Methow will be instituted in the Entiat River watershed. For more information about these procedures used in the Central Region, please contact Phil Crane by telephone at (509) 454-7647, or by e-mail at [pcra461@ecy.wa.gov](mailto:pcra461@ecy.wa.gov).

- If over time the existing gauge sites are determined insufficient for monitoring and enforcement purposes, Ecology will coordinate with the EWPU (or its successor) in developing recommendations to move or add to the existing sites; and record such change through collaborative rulemaking, in the same manner as accomplished for this rule.

#### Implementation of the Reservation:

- Outreach and communication, see #2.
- Ecology has been working with Chelan County and the EWPU developing a process to administer the reservation (see June 30, 2005 Draft “Draft Proposal to Chelan County for Water Tracking Assistance in the Entiat WRIA). This document will continue to be developed throughout year one of Phase 4 (Implementation) under the watershed planning act. The Detailed Implementation Plan, due one year after the initiation of Phase 4, will include a Draft-Final version of this Water Tracking procedure, and undergo a “beta-test” early in 2006. If the procedure is deemed successful by Ecology, EWPU, and County it will be used for further tracking, unless other inadequacies are identified that necessitate change. Change to the procedure will be made with the agreement of Ecology, the EWPU, and Chelan County. If the “beta-test” or other revised procedures are not effective, Ecology, the EWPU and Chelan County will work together to correct the procedure, but will continue to track according to the most current procedure used.
- Ecology intends to use the Notice of Intent or an application for water right as a “gateway” for those prospective water users who want to withdraw ground water or divert surface water and use water from the reservation. A “hard copy” process has been developed, to be used until an automated electronic mechanism is in place, and will continue for the benefit of those who may not have computer access. Consistent with the June 30, 2005 Draft proposal, Ecology will share this information with the EWPU and Chelan County no less than on an annual basis, beginning with a first report by February, 2006.
- Ecology intends to develop a link through the Well Construction website and electronic Notice of Intent function to inform people whether or not they are in the reserve area and whether there is water available in the reserve, and to print out the conditions of use for the reserve. Chelan County is similarly proposing to develop a link through its AS400 system to use a GIS-based function to help determine the relationship of development through the County approval processes to the management of the reserve.
- An electronic accounting system will be created to keep track of what is allocated and what remains, in total and within each use category. WAC 173-546-070(12) states that “the department shall notify both Chelan County and the planning unit or its successor, in writing, when it determines that fifty percent, seventy-five percent, and one hundred percent of the reservation is allocated. The department shall also issue a public notice in a newspaper of general circulation for the region at the same three junctures”.
- In addition to the annual reserve accounting procedure outlined in the June 30, 2005 draft (to be made draft-final in the EWPU Detailed Implementation Plan), this rule required Ecology and the EWPU to evaluate the effectiveness of this rule, including the reservation no less than every five years. In the years 2010, 2015, and 2020. The allocated and unallocated amounts for each use will be reviewed, as will the allocated and unallocated

amounts for the entire reserve. Modifications to the program may therefore be implemented by rule, if needed.

- Permit staff at the Central Regional Office will use both WAC 173-546 and the Entiat WRIA Management Plan as the rule and frameworks, respectively, for decision-making. For a use to qualify for water under the reservation it must meet the standards in WAC 173-546, as well as efficiencies and standards in the Entiat WRIA Management Plan.
- All uses must be within the stream management units defined by this chapter.
- Commercial agriculture and commercial and light industrial uses – are specifically limited to the Lower Entiat stream management unit, the lower 16.2 river miles of the Entiat River watershed.
- For light industrial uses: Ecology staff will work with the county to more precisely define what uses fall into this category to ensure consistency with land use/zoning. Staff will be informed of the necessity for decisions under this section of the rule to be consistent with Chelan County Code, Ch. 11.04.010 regarding “value added operations”, and will need to work with Chelan County to assure consistency.

Maximum future allocations:

- Implementation will be outreach and communication, see #2.
- An accounting system will need to be created and maintained, to ensure that the maximum allocation amounts are not exceeded. This accounting system will be coordinated with Chelan County and the EWPU (or its successor), consistent with the intent of the June 30, 2005 Draft proposal.
- If the maximum amounts are fully appropriated, the department shall notify the Chelan County and the planning unit (or its successor) in writing, and issue a public notice in the local newspapers (this is written into the rule).
- Policy will be developed, in conjunction with staff at CRO, regarding pending applications.

Funding – pieces that will need to be in place for all the water resource management rules being developed, including the Entiat:

- to develop and maintain the automated electronic pieces (e.g. link through Well Construction/Notice of Intent and the accounting of the reserve and maximum allocation limits). Initially the processing of Notice of Intent and their “gateway” function can be done manually;
- accounting of permitted uses can be done electronically using WRTS, but a beta-test will need to be done of Ecology/EWPU/Chelan County methods to account for water developed through permit-exempt wells; and
- to assign a staff person to review the Notices of Intent, review permits issued from the reservation, maintain an accounting, of the amounts committed with regard to each use

within the reservation, coordinate annually with the County and planning units, and provide notification of the reserve at 50, 75 and 100% allocation levels.

**2. Please describe how the Agency intends to inform and educate affected persons about the rule (RCW 34.05.328(3)(b)).**

The responsibility for informing and educating the public will be a shared responsibility between Ecology and the planning unit.

We are proposing a series of informational sessions, geared to different affected groups. First, of course, is the general public, especially those who will need water from the reserve in order to develop their property. We will also reach out to well-drillers, realtors and title company representatives, and county employees who issue building permits and subdivision approvals; and to other groups that request information or are identified as needing more.

We have already spoken at two statewide trainings for well-drillers, to inform them about the water resource management rules being developed, including the Entiat. The presentations described the purpose and content of the rules, and specifically addressed the anticipated impact of the reserves on the business of well-drilling. Time for questions was included.

In addition to face-to-face sessions, we will prepare various written materials, such as Question and Answers and Focus sheets. This information will be distributed through our electronic Listserv and through distribution lists provided locally, available in various public places (ex: libraries and county offices), and be on our internet site. One or more press releases/articles will be submitted for publication in the local paper(s). We will also supplement various existing materials, such as the Homeowners Packet which is used by the public for well-drilling information and guidance.

We may designate a staff member as a contact person (perhaps with an 800 number) to answer questions.

**3. Please describe how the Agency intends to promote and assist voluntary compliance for this rule (RCW 34.05.328(3)(c)).**

Water Resources staff are currently developing a program-wide compliance and enforcement strategy; instream flows, reservations, and other elements of this rule will be part of that strategy.

Outreach and communication will be the key tools here. The rule is very specific about compliance and enforcement (section 120), as consistent with RCW 90.03.605. The first step for promoting voluntary compliance is providing technical assistance. The Water Resources Program is preparing a Q&A on the rule generally, and will develop more specific additional materials as needs are further identified. Water Resources staff will work with the watershed lead and planning unit members providing one or more local informational sessions for the general public and/or specifically affected groups such as the well-drillers. Information on the rule will be on the Ecology website, and will be distributed through a Listserv.

Reserve: Persons who will be using water from the reserve will be informed at a number of junctures of the conditions of use, including the point at which they submit their Notice of Intent to Ecology, and at the county level when they apply for a building permit.

**4. Please describe how the Agency intends to evaluate whether the rule achieves the purpose for which it was adopted, including to the maximum extent practicable, the use of interim milestones to assess progress and the use of objectively measurable outcome (RCW 34.05.328(3)(d)).**

The purpose of this rule is to retain perennial rivers, streams and lakes in the Entiat River basin with the instream flows and levels necessary to protect and preserve instream resources; to provide reliable and adequate water for certain future out-of stream uses as specified by the EWPU in the Entiat WRIA Management Plan (i.e. reservation); and provide some water for storage or other seasonal out-of-stream use while protecting ecological functions of peak annual runoff (maximum allocation of water).

Evaluation of the efficacy of this rule will be done in collaboration with the EWPU (or its successor), just as it was collaboratively developed with the EWPU. Regular planning unit meetings (currently held quarterly) are the primary forums within which evaluations are made of programs implemented by this rule, or related actions in the Entiat WRIA Management Plan are implemented by Ecology or EWPU members and partners. Monitoring information specific to this rule (e.g. administration of reservation, streamflow gaging) or via other programs (e.g. salmon recovery plan implementation, USGS gaging, USFS watershed and biological monitoring, USFWS biological monitoring) are reported to the EWPU at each meeting. Concerns of Ecology or others about unexpected or undesirable trends in data are addressed first by the EWPU (or its successor), or further developed by a sub-committee and brought back to the planning unit for action.

The EWPU is instituting an adaptive management process whereby at least annually the monitoring information is compiled and reported to the EWPU (or its successor), and the general public through an annual monitoring workshop. Under this adaptive management process, a report will be generated by the Chelan County Conservation District on behalf of the EWPU, compiling all the monitoring information in both hard copy and GIS-based formats.

Key Questions of interest to Ecology regarding this rule:

(A) Instream flows:

- (a) Have the biological conditions been maintained or improved?
  - i. Are there significant changes in adult returns? (redd monitoring)
  - ii. Are there significant changes in smolt to smolt survival? (trap monitoring)
  - iii. Are there significant changes in macro-invertebrate abundance? (ambient)
  - iv. Are there significant changes in macro-invertebrate species composition? (EPT ratio)
- (b) Are flow and maximum allocation-conditioned water uses in compliance with permit conditions?
  - i. Are there any flow-conditioned rights that were in use when flows were not met?
  - ii. Are there any trends in compliance with flow-conditioned water uses?
- (c) Have the hydrologic conditions been maintained or improved?
  - i. Are there significant changes in timing or volume of peak flow?

- ii. Are there significant changes in the duration of low-flow events (i.e. late summer through winter)?
- iii. Are there measurable changes in low-flow events associated with flow-enhancement projects?

Instream flow evaluations will be made based on gaging and hydrographic work with partners including USGS, USFS, and Chelan County Conservation District hydrographers and WDFW project monitors. Ecology staff monitoring permits with conditions will compile a record, annually, of compliance with flow and maximum allocation conditions and share this record with the EWPU. Biological evaluations will be made with the EWPU based on myriad biological assessments being conducted by partners including the Upper Columbia Salmon Recovery Unit's Regional Technical Team (RTT), USFS, USFWS, WDFW, Chelan PUD, Yakama Nation and other biologists and scientists working with the EWPU. Record of findings will be shared with the EWPU to include in the annual adaptive management and monitoring report. Ecology will work with the EWPU developing alternative actions to address issues identified during the annual adaptive management process.

(B) Reservation:

The rule includes a provision that the reservation will be evaluated by the department and the planning unit no less than every five years (2010, 2015, 2020), and modifications to the program may be implemented as a result, in rule if needed. Ecology will work with the EWPU compiling and creating a record of uses counted against the reservation and water still available from the reservation. At these times, the accounting assumptions for each use will be reviewed and revised if necessary. The rule includes a provision that permit-exempt ground water uses may be metered if more accurate water use data is needed. Therefore Ecology and the EWPU will consider the need for more accurate information if there is too much uncertainty or disagreement regarding accounting of water related to the reservation.

**5. Please describe how the Agency intends to train and inform Ecology staff regarding new rule or rule amendment.**

Additional training(s) specific to this rule will be held at CRO for permit writers and well construction staff as needed, since their work will be directly affected by the rule. Information sessions can be scheduled for Water Resources and other agency staff if requested.

**6. Identify new supporting documents that need to be developed because of a new rule.**

Q & A(s)  
Focus sheet(s)  
Conditions of use for reserve  
Press releases  
Web updates/information

*If you require this publication in an alternate format, please contact the Water Resources Program at 360-407-6600 or TTY (for the speech or hearing impaired) at 711 or 800-833-6388.*

## APPENDIX E - MANAGEMENT ROLES AND AUTHORITIES

Excerpted from Upper Columbia Salmon Recovery Plan (UCSRB 2005).

<b>Sponsor/Lead Agency</b>	<b>Management Program</b>	<b>Area affected by Program</b>	<b>Goal of the Program</b>
Bonneville Power Administration	Water Management Program	Upper Columbia Basin	Establish prescriptions that apply to watershed mitigation projects
	Pollution Prevention and Abatement Program	Upper Columbia Basin	Coordinate the management and disposal of wastes generated as a result of BPA work practices
Chelan County	Natural Resources Program	Upper Columbia Basin	Administer salmon recovery efforts
	Conservation Easement Program	Chelan County	Implement conservation easements and long-term agricultural leases to protect riparian habitat.
	Critical Areas Ordinances (CAO) - Wetlands Chapter 19.18B	County building and development but not Agricultural practices	Prevent cumulative adverse environmental effects on water quantity and quality, groundwater, wetlands, and rivers and streams.
	CAO-Fish and Wildlife Conservation Chapter 19.18B	County building and development but not Agricultural practices	Protect unique, fragile, and valuable elements of the environment.
	CAO - Frequently Flooded Areas Chapter 15.48B	County building and development but not Agricultural practices	Promotes public health, safety, and welfare by minimizing public and private losses due to flood conditions.
	CAO - Geohazards Chapter 19.18D	County building and development but not Agricultural practices	Protects the general public and resources from flooding, landslides, or steep-slopes failure.
	Shoreline Master Plan	All shoreline lands counties	New program designed to conserve and enhance anadromous fish resources.
	Stormwater Program Chapter 19.40	Not yet developed	Establish a comprehensive approach to surface and storm-water management that protects property, water quality, aquifers, fish, and increase public education, and preserve natural drainage systems.
	Subdivision Title 17.04.020	Rural areas of the county	Establishes an exemption level of administrative review of property at 20 acres.
	Six Year Transportation Plan	Stormwater drainage and management	Review transportation programs for consistency with the County's Comprehensive Plans.
Salmon Recovery Planning Act (Lead Entity -ESHB 2496)		Provides a framework for coordination of restoration projects.	
Chelan County Conservation District	Watershed Management Act (Lead Agency - ESHB 2514)	WRIA 46	Enables the development of planning units to conduct watershed planning, recommend actions, and coordinate implementation of



			restoration strategies.
NRCS	Environmental Quality Incentive Program (EQIP)	Agricultural croplands and farms	Provides technical, educational, and financial assistance to eligible farmers and ranchers to address soil, water, and natural resource concerns
	Conservation Security Program (CSP)	All agricultural operations on private crop, range, and pasture lands, and orchards	Voluntary program providing financial reward to eligible agricultural operations for stewardship and enhancement practices and activities
	Conservation Technical Assistance Program	Upper Columbia Basin	Provide conservation technical assistance to landowners and agencies on planning and natural resource conservation.
	Emergency Watershed Protection Program	Upper Columbia Basin	Undertake emergency measures to protect life and property from floods, drought, and products of erosion.
	Farm and Rangeland Protection Program	Upper Columbia Basin	Protect farm and rangeland and create an easement
	Forestry Incentives Program	Upper Columbia Basin	Support good forest management practices on private lands
	Grassland Reserve Program	Upper Columbia Basin	Protect range and pasture lands from development (subdivision)
	Grazing Lands Conservation Initiative	Upper Columbia Basin	Maintain and improve management, productivity, and health of privately-owned grazing lands
	Resource Conservation and Development Program	Upper Columbia Basin	Accelerate resource conservation and development
	Soil Survey Program	Upper Columbia Basin	Provide soil survey information necessary for understanding, managing, conserving, and sustaining soil resources
	Soil and Water Conservation Assistance Program	Upper Columbia Basin	Provide cost share and incentive payments to farmers and ranchers to address threats to soil, water, and natural resources
	Snow Survey and Water Supply Forecasting Program	Upper Columbia Basin	Provide information on future water supply.
	Stewardship Incentive Program	Upper Columbia Basin	Provide technical and financial assistance to private forest landowners to keep lands and natural resources productive and healthy
	Watershed Protection, Watershed Surveys, and Flood Prevention Program	Upper Columbia Basin	Assist agencies and participants to protect and restore watersheds from erosion, floodwater, and sediments.
	Wetlands Reserve Program	Upper Columbia Basin	Offers landowners opportunities to protect, restore, and enhance wetlands on their properties.
Wildlife Habitat Incentives Program	Upper Columbia Basin	Provide incentives to develop and improve wildlife habitat on private lands.	
Bureau of Land Management	Environmental Education Information	Upper Columbia Basin	Educate the public on environmental issues

	Integrated Weed Management Program	Upper Columbia Basin	Inventory and complete ecological assessments for noxious weeds.
	Land Exchange Program	Upper Columbia Basin	Provide for acquisition, use, disposal, and adjustment of land resources.
	Leave No Trace Program	Upper Columbia Basin	Promote responsible use of public lands to recreationists participating in human-powered activities
	Watchable Wildlife Initiative	Upper Columbia Basin	Provide wildlife viewing opportunities
Bureau of Land Management and U.S. Forest Service	Interior Columbia Basin Ecosystem Management Project	Upper Columbia Basin	Develop a scientifically sound and ecosystem-based strategy for management of forests.
U.S. Bureau of Reclamation	Federal Columbia River Power System Program BiOp Habitat Mitigation Program	Upper Columbia Basin	Improve stream flows, channel complexity, fish passage at diversion dams, and screen diversion intakes
	Research, Monitoring, and Evaluation Program	Upper Columbia Basin	Develop and implement a monitoring program to assess status, trend, and effectiveness of management actions.
U.S. Department of Agriculture Farm Service Agency	Conservation Reserve Program	Upper Columbia Basin	Help agricultural producers to protect environmentally sensitive lands.
U.S. Environmental Protection Agency	Environmental Monitoring and Assessment Program	Upper Columbia Basin	Assess the condition of ecological resources
	Total Maximum Daily Load Program	Upper Columbia Basin	Specify the maximum amount of a pollutant that a water body can receive and still meet water quality standards.
U. S. Fish and Wildlife Service	Fish and Wildlife Assistance Program	Upper Columbia Basin	Restore and maintain the health of fish and wildlife resources
	Partners for Fish and Wildlife Program	Upper Columbia Basin	Assist private landowners restore wetlands and other important fish and wildlife habitats
	Fishery Resource Program	Upper Columbia Basin	Provide policy guidance, budget, planning, oversight, and coordination of diverse activities.
	Entiat National Fish Hatchery Program	Entiat Subbasin	Produce and release spring chinook salmon into the Entiat River
	Hatchery Assessment Program	Upper Columbia Basin	Conduct production planning, marking, monitoring, and post-stocking evaluations for National Fish Hatcheries
	Native American Tribal Assistance Program	Upper Columbia Basin	Work with tribes to conserve and manage fish and wildlife resources on Tribal lands and ceded territories
	Habitat and Population Evaluation Program	Upper Columbia Basin	Conduct surveys to describe fish populations and other aquatic organisms and their habitats
	Conservation Assessment Program	Upper Columbia Basin	Conduct analytical evaluations of stock assessments, extinction probabilities, and develop sound biological and technical recovery strategies
	Water Management and Evaluation Program	Upper Columbia Basin	Coordinate and manage flow conditions in the Columbia Basin
	Fish and Wildlife Mitigation Program	Upper Columbia Basin	Advocate fish and wildlife habitat needs within the basin

	Information, Education, and Outreach Program	Upper Columbia Basin	Promote public stewardship of fish and wildlife resources and foster support for conservation through outreach strategies.
	Partners in Flight Program	Upper Columbia Basin	Manage and conserve neotropical birds
	Conservation Planning Program	Upper Columbia Basin	Work with private landowners, local and state governments, corporations and others to conserve and protect listed and unlisted species on non-Federal lands
U.S. Forest Service	Pacific Northwest Fisheries Program	Upper Columbia Basin	Develop programs to protect riparian reserves, protect key watersheds, and to restore watershed health.
	Respect the River Program	Upper Columbia Basin	Restore and preserve riparian and flood prone areas and balance those needs with public needs
	Northwest Forest Plan	Upper Columbia Basin	Restore and maintain the ecological health of watersheds within the range of the northern spotted owl
U.S. Geological Survey	National Streamflow Information Program	Upper Columbia Basin	Provide long-term, accurate, and unbiased streamflow information
Washington State Department of Ecology	Columbia River Regional Initiative/Water Resource Program	Upper Columbia Basin	Develop an integrated state program for managing water resources--to allow access to new water withdrawals while providing support for salmon recovery
	Environmental Assessment Program	Upper Columbia Basin	Provide objective, reliable information about environmental conditions used to measure effectiveness of the program and to inform the public
	Flood Control Assistance Program	Upper Columbia Basin	Work in partnership with communities to support healthy watersheds and promote environmental interests
	Water Quality Program	Upper Columbia Basin	Protect, preserve, and restore water quality
	Water Resource Program	Upper Columbia Basin	Manage watersheds, administer water rights, and restore and maintain stream flows.
	Columbia River Instream Resource Protection Program	Upper Columbia Basin	Insure the future viability of instream resource values of the mainstem Columbia River, including fish, wildlife, aesthetics, navigation, and hydropower resource values
	Trust Water Rights Program	Upper Columbia Basin	Develop and test means to facilitate the voluntary transfer of water and water rights, including conserved water, to provide water for presently unmet and emerging needs
	Water Acquisition Program	Upper Columbia Basin	Increase stream flows in watersheds with vulnerable salmon and trout populations
Washington State Department of Fish and Wildlife	Aquatic Education Program	Upper Columbia Basin	Educate the public on environmental and salmon issues
	Aquatic Habitat Guidelines Program	Upper Columbia Basin	Develop technical assistance guidance for those who want to protect and restore salmonid habitat
	WDFW Hatcheries Program	Upper Columbia Basin	Mitigate for chinook, steelhead, and sockeye salmon lost by the operations of Upper Columbia dams
	Hydraulic Approval	Upper Columbia	Regulate activities that affect the bed or flow of

	Program	Basin	waters for the protection of fish life
	Lead Entity Program	Upper Columbia Basin	Solicit, develop, prioritize, and submit habitat protection and restoration projects for funding to the Salmon Recovery Funding Board
	Nature Mapping Program	Upper Columbia Basin	Promote biodiversity studies through citizens and school-based data collection and research
	Priority Habitats and Species Program	Upper Columbia Basin	Provide comprehensive information on important fish, wildlife, and habitat resources
	Salmonid Stock Inventory Program	Upper Columbia Basin	Identify and monitor the status of salmonid fish stocks
	Salmon and Steelhead Habitat Inventory and Assessment Program	Upper Columbia Basin	Characterize freshwater and estuary habitat conditions and distributions of salmonid stocks
	Watershed Recovery Inventory Project	Upper Columbia Basin	Develop a comprehensive inventory of watershed restoration projects and watershed information
	Wildlife Research	Upper Columbia Basin	Conduct scientific investigations of priority wildlife species and habitats
Washington State Department of Natural Resources	Aquatic Lands Enhancement Account	Upper Columbia Basin	Invest in projects that enhance and protect wildlife and fish habitat
	Washington Natural Heritage Program	Upper Columbia Basin	Collect data and develop strategies for protection of native ecosystems and species most threatened
	Washington State Natural Areas Program	Upper Columbia Basin	Protect the best remaining examples of many ecological communities and outstanding examples of native ecosystems, habitat for listed species, and scenic landscapes
Washington Department of Natural Resources	Forest Practices Act, Chapter 76.09 RCW	Upper Columbia Basin	Regulates activities related to growing, harvesting or processing timber on all local government, state and private forest lands.
Washington State Conservation Commission	Agriculture, Fish and Water Program	Upper Columbia Basin	Negotiate changes to the existing Technical Guide and develop guidelines to be used to enhance, restore, and protect habitat for endangered fish and wildlife.
	Conservation Reserve Enhancement Program	Upper Columbia Basin	Provide incentives to restore and improve salmon and steelhead habitat on private lands
	Salmon Habitat Limiting Factors	Upper Columbia Basin	Assess the habitat-based factors limiting the success of salmonids
Washington State Department of Transportation	Wetland and Fish and Wildlife Activities	Upper Columbia Basin	Maintain or implement activities that limit or reduce impacts to fish and wildlife and their habitats
Washington State Parks and Recreation Commission	State Parks Program	Upper Columbia Basin	Acquire, operate, manage, enhance, and protect a diverse system of recreational, cultural, historical, and natural sites
Yakama Indian Nation	Coho Salmon Reintroduction Program	Upper Columbia Basin	Assess the feasibility of re-establishing coho salmon in tributaries to the Upper Columbia River

## **APPENDIX F - WATERSHED RESTORATION EFFORTS COMPLETED**

**On All Ownerships in the  
Entiat WRIA 46  
05/10/2004 Version 2.0**

This working draft list summarizes some of the watershed restoration projects and initiatives conducted on both public and private lands in the Entiat and Mad River watersheds over the last several years. It was created using an unpublished list of projects completed on National Forest System Lands between 1992 and 2003, and additional restoration / protection efforts that have occurred on private/non-Forest System lands within the subbasin. This appendix will be updated in subsequent versions of this document.

### **Burned Area Emergency Rehabilitation**

A significant amount of rehabilitation work has occurred in the subbasin in association with large scale fires. The following reports contain details of the Burned Area Emergency Rehabilitation measures implemented following the Dinkelman and Tyee disturbance events:

- a) Burned Area Emergency Rehabilitation - Final Accomplishment Report for the 1988 Dinkelman Canyon Fire, 1989
- b) Burned Area Emergency Rehabilitation - Final Accomplishment Report for the 1994 Chelan County Fires, 1995

### **Other Restoration-Related Activities**

Other restoration projects and initiatives, mostly road-related on National Forest System lands, implemented since 1992 includes the following:

#### **1992**

- a) Potato Creek Road Decommissioning: Involved decommissioning of a riparian section on the main road in upper Potato Creek (1.6 miles) that had been replaced by a new hillslope route; Treatment included ripping, drain dip installation and revegetation.
- b) Cougar Creek Area Stream Crossing Rehab: Drainage improvement, site hardening and revegetation at 15 perennial stream crossings on the Tyee Ridge Road (5700) in the Billy and Cougar Creek watersheds. Treatments included installation of drain dips, armoring of culvert inlets, outlets and fill slopes, pit-run surfacing at stream crossings, installation of slash filter windrows, revegetation, along with rehabilitation of adjacent non-system roads and disturbed areas. (\$62,000)

c) Reconstruction of the Windy Creek Water Chance: The first of a series of projects targeted at replacing temporary waterchance structures with more natural and stable log weirs.

## 1993

a) Mud Creek Chip-Shred Demonstration Project: Utilized large tub grinder to treat landing pile slash concentrations from the Thin Mud TS; Applied chips for surface erosion control to several test sections of open road and on 3.0 miles of road that were closed. (\$25,000)

b) Mud-Potato Area Road Rehabilitation: Involved rehab work on the dense road network in upper Mud and Potato Creeks; Treatments included drainage improvements (drain dips, ditch relief culverts) and spot surfacing on open roads, as well as road closures (12 miles) and decommissioning (28 miles), with revegetation. (\$17,000)

c) Tyee-Shamel Creek Area Road Rehabilitation: Involved road rehab work on the dense road network in the Shamel Face area; Treatments included drainage improvements (drain dips, ditch relief culverts) and spot surfacing on open roads, as well as road closures (14 miles) and decommissioning (11 miles), with revegetation. (\$35,000)

d) Silver-Pope Area Road Rehabilitation: Stabilization of four major stream crossings and drainage improvement on adjacent road sections on the 5901/5902 roads. Treatments included rip-rap armoring of crossings, gravel surfacing, installation of 2 sub-surface drains, drain dips, and revegetation (alder planting, grass seeding and fertilization). (\$34,000)

e) Lower Potato Creek Road Rehab: Involved drainage improvements on the North Fork Potato Creek Road and a newly relocated section of the main Potato Creek Road by the Forest Road Crew; Treatments included cut slope stabilization, drain dip installation and armoring and spot surfacing. (~\$25,000)

f) Water Chance Reconstruction: Rehabilitated 3 sites associated with road crossings in Mud and North Fork Potato Creeks as described above for the Windy Creek site in 1992.

g) Tommy-Silver-Pope Alder Planting: Involved the planting of surplus alder starts (from Wenatchee FSL) on a number of cut slopes in the Silver-Pope area (approx. 5 acres) and on two debris avalanche tracks in Tommy Creek (approx. 7 acres).

## 1994

a) Mills-Roaring Creek Road Rehab: Involved road rehab work in the Mills/Dinkelman/Roaring Creeks area; Treatments included drainage improvements (drain dips, culvert improvement/installation), road reshaping, crossing improvements,

road closures and revegetation; This work was completed under three separate contracts prior to the start of the Tye Fire. (\$29,000; Mills Creek, Roaring Creek and Old Camp Road contracts)

b) Roaring Creek Riparian Clean-Up: A community-based improvement project targeted at improving conditions in and public awareness of Roaring Creek and its riparian area; Treatments on various ownerships included removal of four abandoned automobiles and other litter, tree planting and closure of user-built ORV trails in the riparian area.

c) Lake Creek Road Rehabilitation: Involved road rehab work in the Lake Creek basin on the 5904 road and spurs; Treatments included armoring of crossings, spot surfacing, installation of 2 sub-surface drains, drain dips, culvert improvement/installation, cut/fill slope reshaping/armoring (rock, logs) and revegetation; This project was contracted in 1994 and was completed in two parts. Lake "Early" was completed in 1994 (\$27,000). Lake "Late" was completed in 1995 (\$80,000).

d) Lower Tye Road Prep: Involved preparation of the lower Tye Road for paving/re-paving; Treatment included cut slope reshaping, ditchline refinement, ditch relief culvert installation and prism reshaping in unpaved sections of this road; This project was partially completed in 1994, shut down during the Tye Fire and completed in the 1995 field season. (\$86,000)

e) Tye Fire Emergency Burned Area Rehabilitation: A massive amount of burned area rehabilitation work was accomplished in the fall of 1994 on roads within the fire area (see Final Accomplishment Report for 1994 Chelan Fires).

f) Mud-Potato Creek Road Rehab: This project was planned and contracted prior to the Tye Fire. Some of the planned work was either completed or modified by Tye Fire Emergency Burned Area road rehab work. The project was redesigned and completed in 1995 and included fill slope stabilization, drain dip and culvert installation, spot surfacing and revegetation. (\$65,000)

g) Lower Tye Road Paving: Involved asphalt paving of a native surface section of the lower Tye Road, as well as repaving of adjacent road segments; This project was contracted in 1994 and completed in 1995. (\$147,000)

h) Tommy Creek Road Rehab: Involved road rehab work on the Tommy Creek Road system; treatments included stream crossing stabilization, drain dip installation, surfacing to the new trailhead, and road closures, with revegetation. The project was contracted in 1994 and completed in 1995 under two separate contracts. (\$12,000)

i) Tye-Berg Area Road Rehab: This project involved road rehab work along the 5700 road from the end of the pavement to Berg Creek. The project was planned and contracted prior to the Tye Fire. Some of the planned work was either completed or modified by Tye Fire Emergency Burned Area work. The project was redesigned and

completed in 1995 and included prism reshaping, drainage improvement (dip/culvert installation, installation of a french drain, relocation of the Camp Nine Trailhead, pit-run surfacing and revegetation. (\$100,000)

## 1995

a) Many of the road rehab projects contracted in 1994 were completed during the 1995 field season, as noted above.

b) Tye Fire Emergency Burned Area Rehabilitation work was continued during the 1995 field season, including the following road-related projects.

(1) Steliko Road Rehab: Involved road drainage improvement (rock-lined ditch and drainage features) on the lower Steliko Road by the Forest Road Crew. (\$5,000)

(2) Stormy Creek Check Dam Maintenance: Involved rework of ten loose rock check dams in lower Stormy Creek to better define the main channel, protect vulnerable banks and begin restoration of fish passage. (\$2,300)

(3) Potato-Stormy "Early" Road Rehab: Involved drainage improvement (drain dip/culvert installation), stream crossing/fill slope stabilization, temporary road relocation, spot surfacing and revegetation on roads in the lower Potato and Stormy Creek drainages, in response to damage from spring runoff. (\$30,000)

(4) Tye-Sugarloaf Road Rehab: Involved spot treatment of problem road sections in the Mad River watershed; Treatments included drainage improvement (2 culverts in Windy Creek; 3 in Tillicum/Indian Creeks; drain dips), prism reshaping, spot surfacing, fill slope stabilization and revegetation. (\$45,000)

(5) Indian Creek Flood Repair: Involved repair of spring runoff damage on the Indian Creek crossing on the Tillicum Road; Treatments included trash rack removal, road surface repair, ditch and culvert cleaning and fill slope reconstruction. (\$5,000)

(6) Pope Creek Flood Repair: Involved restoration of the Pope Creek crossing on the Entiat Valley Road following passage of a debris torrent initiated by spring runoff. (\$8,000)

(7) Bear-Potato Early Road Rehab: Involved continuation of Emergency Burned Area Treatments on road in the Mud and Potato Creek drainages; Treatments included drainage improvement (drain dips, culvert installation), spot surfacing, fill slope stabilization and revegetation. (\$49,000)



(8) Tye Fire Culvert Replacement: Involved the installation of four large, concrete box culverts at four stream crossings in lower Mud and Potato Creeks by the Forest Road Crew. (\$72,000)

(9) Tye Fire Late Road Rehab: Involved drainage improvement, surfacing and revegetation on priority, problem road segments within the fire area that were not treated in any previous contracts; Treatments included drainage improvement (dips, culvert improvement), prism reshaping, spot surfacing, slash filter windrow placement, road decommissioning (riparian road sections in N Fk Mud and Potato Creeks) and revegetation. (\$36,000)

(10) Tye "Follow-Up" Road Rehab: Continuation of the work described in the Tye Fire Late Project, including rehab of the S Fork Mud Creek Road (dips and spot surfacing) and completion of the road decommissioning work. (\$24,000)

(11) Rehab Gravel Replacement: Involved the crushing and stockpiling of a supply of crushed gravel for future maintenance and watershed restoration work. (\$80,000)

(12) Tye Pavement Repair: Involved chip seal coating of 9.3 miles of the Tye Ridge Road from McKenzie Saddle to the Tye Lookout Road as a result of heavy use by Tye Fire traffic. (\$102,000)

(13) North Fork Drainage Improvement: Involved installation of three new culverts on 5380/5390 roads in upper North Fork Potato Creek by the Forest Road Crew. (\$4,000)

c) Steliko Work Center Surfacing: Involved paving of the access road and parking areas at the Steliko Work Center. (\$14,500)

## 1996

a) Early Entiat Road Rehab: Involved the installation of drain dips, spot surfacing and fill slope stabilization on lower Mud and Potato Creeks in response to spring runoff within the Tye Fire Area. (\$35,000)

b) Shamel Creek Road Rehab: Involved repair of one culvert crossing that had been damaged during spring runoff. (\$4,000)

c) Mud-Potato Creek Culverts: Involved installation of several stream crossing structures on road sections in lower Mud and Potato Creeks. Treatments included spot surfacing and armoring of fill slopes. (\$44,000)

d) Tillicum-Miners Road Rehab: Involved road drainage improvement (drain dips, culverts) cut slope stabilization, surfacing and revegetation on the lower Indian Creek Road. (\$38,000)

e) Indian Creek Culvert Replacements: Involved the replacement of two existing, round corrugated metal culverts that were fish passage barriers with open bottom arch culverts. (\$54,000)

f) Tye-Berg Road Rehab: Involved drainage improvement (dip improvement/installation), pit-run surfacing and revegetation on the upper Tye Ridge Road (5700). (\$86,000)

g) Lake Creek Area Road Rehab: Involved completion of drainage improvement and slope stabilization work on the Lake Basin Road (5904) that was started in 1994. Also involved drain dip installation on a portion of the Shady Pass road, culvert improvement at a crossing on the Tommy Creek road and reshaping/resurfacing of a portion of the Tillicum Creek Road (above Tillicum Creek crossing). (\$81,000)

h) Tye Guardrail Installation: Involved installation of 400 feet of guardrail on a steep section of the Tye Ridge Road that had been recently paved in 1995. (\$10,000)

i) Tillicum Fan Restoration: Involved revegetation work on the alluvial fan at the mouth of Tillicum Creek; Treatments included soil decompaction (moldboard plow, disc, harrow), grass seeding, alfalfa cultivation, tree planting and noxious weed removal (hand pulling). This project was completed in 1997 as part of the Entiat Area Road Rehab project. (\$10,000)

j) Swakane Canyon Beaver Habitat: Involved armoring of an existing stream crossing on the Swakane Canyon road to accommodate beaver use of the road fill and culvert as a dam.

## 1997

a) Mills Canyon/Old Camp Road Rehab: Involved drainage improvement work (primarily drain dip installation/reconstruction and prism reshaping) on the Mills Canyon and Old Camp Roads. (\$49,000)

b) Entiat Channel Restoration Project: Involved a variety of in-channel and bank treatments in association with riparian corridor roads and stream crossings in the Stormy, Potato, Mud and Indian Creek drainages; Treatments included maintenance of burned area rehab check dams in Stormy and Potato Creeks, installation of low-profile, upstream pointing rock weirs, and large woody debris placement in channel sections adjacent to corridor roads and at stream crossings. (\$45,000)

c) Entiat River Bank Stabilization and Fish Habitat Restoration Project: Involved more than 1300 feet of bank treatments called "rootwad revetments" followed by riparian shrub plantings during September 1997. Treatments included placement of more than 100 conifer logs with rootwads, erosion control seeding, and planting more than 10,000 native shrubs on private lands in the "Stillwaters" reach of the Entiat River. The project was accomplished by 10 partners. (\$153,000)

d) Entiat Area Road Rehabilitation: Involved drainage improvement and stabilization work on lower Shady Pass and in the Silver-Pope, Mud, Tillicum and Indian Creek drainages; Treatments included drain dip construction/reconstruction, ditch relief culvert installation/rehab, prism reshaping, spot surfacing, armoring of stream crossings and weir placement. Completion of restoration work on the Tillicum fan site included removal of litter/metal debris and an unsafe wooden structure, removal of old concrete structures, bridge abutment and toe slope stabilization, installation of vehicle barriers, spot surfacing, noxious weed removal, native grass seeding and shrub planting. (\$99,000)

e) Shamel/Byers Road Repair: Involved repair of spring runoff damage to a culvert crossing on Shamel Face and a section of road in Byer's Canyon needed for reforestation access; Treatments included culvert improvement, running surface repair, drain dip installation and revegetation. (\$6,000)

f) Upper Indian Road Rehab: Involved repair of spring runoff and storm damage in Upper Indian Creek and Hornet Creek; Treatments included culvert improvement, drain dip installation and fill slope stabilization. (\$5,000)

g) Upper Mud-Potato Area Road Closures: Involved road closures and spot drainage improvements on some open road segments in the road system in upper Mud and Potato Creeks; Treated roads were those used during salvage and post-fire reforestation work, that were no longer needed for access; Treatments included drain dip installation, decompaction by sub-soiling (self-drafting) and revegetation (grass). (\$30,000)

h) Potato Creek Flood Repair: Involved repair of runoff damage to sections of the lower Potato Creek road and the North Fork Potato Creek road, resulting from a severe thunderstorm on 8/26/97. Treatments included slough removal, prism reshaping, culvert repair, crossing stabilization and revegetation.

i) Steliko Work Center Road Rehab: Involved drainage improvements on the Steliko Road adjacent to the FS Work Center and County Maintenance Shop; Treatments included installation of culvert bypass under the Entiat Valley Road, rework of the large rock deflector wall and initial preparation for culvert installation in the warehouse area of the Work Center. Work was completed by County and Forest Service crews.

j) Lake/Fox Creek Widening: Involved correction of public safety hazards at three locations on the main Entiat Valley Road; Treatment included widening and guardrail installation, with surfacing of two sites. (\$74,000)

k) Mud Creek Meadows Soil Rehab: Involved sub-soiling (self-drafting) and grass seeding of several old log landings in the Mud Meadows area above the 5300-217 road. This work was conducted as part of a demonstration training on the use of the self-drafting, winged sub-soiler. (\$4,000)

## 1998

a) 1998 Timber Sale EC Coop (Buy-Back) Work: Sub-soiler work completed on skid trails and landings in Stutzman's EC buy-back plan. This coop work was completed in 1998 and included; 2.88 miles of skid trail treatment on the Mad Billy Timber Sale (\$2,000.00), and 3.38 miles of skid trail treatment on the Round Up Timber Sale (\$1,900.00).

b) Swakane Area Road Rehab: Drainage improvement and reconstruction on several roads in the Swakane area. This work included; 3.10 miles of reconstruction/construction of drain dips and road drainage improvements on Road # 7400 (Derby Canyon Road), 4.25 miles of reconstruction/construction of drain dips, spot surfacing, fillslope/channel rip rap armor on Road # 7415 (Lower Swakane Road), 3.15 miles of reconstruction/ construction of drain dips, spot surfacing, rip rap armor of ditchline, fillslope armor of drain dip outlets on Road # 7415 (Upper Swakane). Total cost \$56,000, contract completed 11/12/98.

This project included approximately \$7,500.00 of work on sections of road onWDFW lands through a Wyden Amendment agreement.

c) Tillicum-Moe Road Rehab: Road improvements on Road # 5810 Moe Ridge and Road # 5800 Tillicum Creek Road. This work included construction and reconstruction of drain dips, road drainage improvements, spot surfacing, ditch pulling of 3.21 miles of road #5810. This project also included insloping of existing road prism for drainage improvement, spot surfacing, ditch cleaning, and general blading and shaping of 5.16 miles of road #5800. Total project cost was \$71,000 and the contract completed 10/26/98.

d) 1998 Steliko Stream Rehab: This project entailed fixing a leak in the channel retaining wall and excavation and replacement of water pipe behind the barn. \$4,004.00; project completed 9/9/98.

e) Spot Surfacing Entiat River Road: This was a road prism stabilization project with erosion control of sections of the upper Valley Road # 5100. Approximately 1 mile of native material road was surfaced over a 4 mile stretch using a Forest Road crew and equipment rental dump trucks. (\$15,000.00)

f) Tyee Lookout Road Drainage Improvement: Installation of 46 drain dips and road drainage improvements on 3.85 miles of # 5713 Tyee Lookout road. (8/98, \$2,000.00)

g) Sugarloaf Road Rehab near Lookout Road Junction: Spot surfacing of 0.20 miles of road with pit run armour and general blade and shape of road prism to improve road drainage. (\$5,000.00 5/27/98)

h) Preston-Dill Road System Storm Damage Repair: Backhoe work on plugged culverts on roads # 5501, # 5502, # 5503. Removal of storm caused small slides and clearing of debris plugged ditches (8/25/98 \$3000.00)

## 1999

- a) Upper Entiat River Road Rehab: Spot surfacing and drainage improvements on approximately 2 miles of the Upper Entiat River Road; included surfacing Three Creek and Spruce Creek CG access roads. (\$20,000 10/99)
- b) Tommy Creek Dispersed Site Rehab: Decompaction, traffic control and revegetation of dispersed campsite roads along lower Tommy Creek Road. (\$4,000 10/99)
- c) Stormy Creek Check Dam modification: Third and last modification of the loose rock check dams installed in lower Stormy Creek during the 1994 Tye BAER. (\$5,000 10/99)
- d) Indian Creek Dispersed Site Rehab: Decompaction, traffic control and revegetation of dispersed campsite/sheep bedding area at the mouth of Indian Creek, including rework of outlet rock on lower arch. (\$1,000 10/99)
- e) Upper Entiat Valley Road Asphalt Surfacing: Asphalt surfacing of approximately 1/3 of the Upper Entiat Road through the North Fork CG. (\$25,000 9/99)
- f) Upper Entiat Spawning Channel Restoration: Approximately a quarter mile of previously constructed spawning channel was repaired. Since repair, spring chinook, steelhead and occasionally bulltrout have been observed spawning in the channel. (8/04)

## 2000

South Fork Mud Creek Relocation: Riparian road relocation in South Fork Mud Creek Road (#5340). This included 1.95 miles of new road constructed, 1.10 miles of road reconstructed and 1.85 miles of road obliteration. (\$174,000)

Projects and initiatives on private/non-Forest System lands within the subbasin include:

- a) Property Acquisitions: The Chelan-Douglas Land Trust received grant monies from the State Salmon Recovery Funding Board to purchase property along the mainstem Entiat River for the protection of properly functioning riparian/fish/wildlife habitat.

## 2001

Mud Creek Road Relocation: Approximately 3 miles of the Main Mud Creek road (#5300) relocated away from the riparian zone. This project included decommissioning 3.9 miles of road located within riparian zone. (\$241,000)

Projects and initiatives on private/non-Forest System lands within the subbasin include:

- a) Property Acquisitions: The Chelan-Douglas Land Trust received grant monies from the State Salmon Recovery Funding Board to purchase property along the mainstem Entiat River for the protection of properly functioning riparian/fish/wildlife habitat.
- b) Entiat Instream Structure Installation: The Bureau of Land Management, in cooperation with WDFW and USFS, installed two engineered log jams at river mile 10.3, and two boulder barbs with root wads at river mile 15, in the fall of 2001. These projects were installed as part of an ongoing effort to restore habitat complexity in the Entiat River below the Potato Creek Moraine.

c) Entiat Instream Structure Installation: The Natural Resource Conservation Service, in cooperation with the Chelan County Conservation District, USFWS, and BLM, installed two low profile cross vane structures just below the fire station bridge, and an additional structure above the Dinkleman Canyon Road bridge, in the fall of 2001. The structures have added juvenile rearing and adult resting/holding pool habitat in the lower Entiat River.

## 2002

a) Tommy Fire BAER: 220 acres of uplands were aeriually seeded and the drainage on 3 miles of trail was improved following the Tommy Fire. (\$12,400)

b) Entiat River Road Resurfacing: gravel surfacing was added to approximately one mile of road (\$40,000).

## 2003

a) Riparian Road Relocation: Spot seeding and mulching was applied to a two mile section of the Mud Creek Road that was decommissioned in 2001. (\$3800)

b) Spruce Grove Campground Restoration: A buck and pole fence was erected to reduce recreation impacts on the riparian area. (\$3000)

# **APPENDIX G - DRAFT WATER TRACKING SYSTEM**

## **2005 Draft Proposal to Chelan County for Water Tracking Assistance in the Entiat WRIA**

### **Background**

During the Entiat watershed planning effort, a 5 cfs reserve of water was negotiated to support new growth in the Entiat valley. Reserve water will be available through the year 2025 to serve qualified new water uses (residential, business/light industrial, commercial agriculture). The water resources management program (Chapter 173-546 WAC) is on schedule to be codified in September 2005.

In anticipation of rule codification, members of the Entiat Watershed Planning Unit (EWPU) have been meeting to identify mechanisms available for tracking new water uses and quantities. The interrelationship among the Building Planning Department, the Chelan-Douglas Health District, and the Department of Ecology (see table on the following pages) was discussed to clarify roles and procedures, and determine the easiest, most feasible methods to initiate new water use development and tracking.

### **Findings**

It was determined that:

- Data already being collected by agencies should be sufficient to create a new water use tracking framework;
- Data from agency partners should be compiled and reviewed on an annual basis; and
- Data from multiple sources and databases must be used to adequately estimate new water use.

### **Recommendations**

- The Conservation District should be responsible for requesting, compiling and analyzing data for the Entiat WRIA on an annual basis, due to its non-regulatory role and lead for the Entiat watershed planning and implementation effort.
- The Chelan County Natural Resources Program should be responsible for coordination among staff and departments within Chelan County.
- County AS400 and excel database permit information; Health District well information; and Ecology WRATS and Well Log data should be considered in the analysis.
- A three- or four-space alphanumeric code to the County AS400 database so that WRIA/watershed information can be entered along with building permit data to facilitate annual data tracking and downloads by watershed region.
- The Conservation District should work with County Natural Resources Program staff to develop the codes.
- The Conservation District and County Natural Resources Program should coordinate distribution of WRIA, watershed/subwatershed/assessment unit, and city Urban Growth Area (UGA) GIS datasets to the County Building and Planning Department so that the boundary information necessary for AS400 data entry is easily obtainable via the existing County GIS display and information retrieval system.
- AS400 codes and GIS data should be in place and ready for use by the County by October 2005, so that "beta-testing" of the new system can occur prior to January 2006.
- If necessary, a Memorandum Of Understanding (MOU) or other appropriate interagency agreement should be developed among the entities to formally define data sharing and roles.

Type of New Use	Agency/Division	Role/Nexus for Tracking	Tracking Method	Comments/Assumptions
Commercial Ag.	Ecology Water Resources Program	Issuance of new water rights	Water Rights Tracking System (WRATS); Geographic Water Information System (GWIS)	For expansion of existing commercial agriculture operations or new agricultural water use, a water right will be required.
Business/Light Industrial	Ecology Water Resources Program	Issuance of new water rights	Water Rights Tracking System (WRATS); Geographic Water Information System (GWIS)	If the new business/light industrial water use does not meet exempt well provisions (not to exceed 5000 gallons per day; Chapter 90.44.050 WAC) or otherwise does not qualify for exempt well water use, a water right will be required.
	Chelan County Building and Planning Department	Issuance of special use permits for home-based businesses, etc.	Conditional and Administrative Use permits; Ecology and Department of Health water use estimates for various commercial ventures.	Special use permits and business water use estimates may be used to track exempt well withdrawal volumes for new home-based businesses. If a new venture exceeds 5000 gallons per day, a water right will be required.
	Chelan-Douglas Health District	Review and approval of Group B wells and inspection of proposed Group A well sites.	Chelan-Douglas Health District database(s).	Some businesses may require a Group B well system (up to 15 connections and needs water right). Large Group A systems also require CD-HD approval and water right.
Residential (single home)	Chelan-Douglas Health District	Certification of potable water via issuance of onsite sewage permits.	Chelan-Douglas Health District database(s).	The Chelan-Douglas Health District certifies that potable water is available <sup>1</sup> as part of the onsite sewage permitting process.
	Ecology Water Resources Program	Well logs created by commercial drilling companies are required to be submitted to Ecology	Ecology well log database	If a new well is dug through use of a drilling contractor, and the well log is submitted to Ecology, it will be recorded in their database.
Residential (single home, continued)	Chelan County Building and	Issuance of building permits; recording structure	Building and Planning Department excel	Proof of potable water is required for a County building permit <sup>2</sup> ; when permits

<sup>1</sup> A private water review is requested from the Health District, after which a site visit is performed. Data on whether water is from a new or existing single or group exempt well or public water hookup, meets construction standards, has sufficient pumping rate, etc. are collected. In the case of wells on new lots, they may be/are drilled prior to actual home construction. Therefore, building permits are assumed to be the ultimate indicator of new water use/withdrawal occurring.

<sup>2</sup> It is known that not all people obtain building permits. As a result, the Assessor's AS400 database does not necessarily contain current data on all new homes in which people are residing. Data (house size, value, etc.) for illegally constructed homes in each of the four County regions are collected by appraisers and



	Planning Department; County Assessor's Office	information.	database and Assessor's AS400 database.	are issued they are logged in the County excel and AS400 databases. Data on whether final inspection and occupancy approval has been performed is also input and tracked in excel.
Residential (short plats - four or fewer lots)	Chelan County Building and Planning Department; County Assessor's Office	Approval of short plats; assignment of new parcel numbers to final short plat lots.	Building and Planning Department excel database and Assessor's AS400 database.	Up to four <sup>3</sup> new lots/residences created via a short plat may be served by a group exempt well; <i>combined use</i> may not exceed 5000 gpd. Since 1995, policy states that wells must be in place for a short plat to be finalized.
	Chelan-Douglas Health District	Certification of potable water via issuance of onsite sewage permits.	Chelan-Douglas Health District database(s).	The Chelan-Douglas Health District certifies that potable water is available (see footnote 1) as part of the onsite sewage permitting process.
	Ecology Water Resources Program	Well logs created by commercial drilling companies are required to be submitted to Ecology; Issuance of new water rights	Ecology well log database; Water Rights Tracking System (WRATS); Geographic Water Information System (GWIS)	If a new short plat qualifies for a group exempt well, the well is dug through use of a drilling contractor, and the well log is properly submitted to Ecology, it will be recorded in their database. If the water use of new homes built on a short plat exceeds 5000 gpd or involves watering of more than ½ acre of lawn or garden per home, a water right will be needed.
Residential (long plats,	Chelan County	Approval of long plats and	Building and Planning	Up to six <sup>4</sup> new lots/residences created

input into the AS400 over time (every 4 years), as appraisers review one of each of the four regions annually. It is envisioned that annual Health District and Ecology onsite sewage permit/well log information will help account for homes built without permits, and associated new water use.

<sup>3</sup> In accordance with the State Supreme Court Decision in Ecology v. Campell and Gwinn, LLC (March 28, 2002), the Health District adopted policy (November 18, 2002) stating that each single family residential unit shall be considered to utilize 1250 gallons of water per day, in the event that no separate irrigation water exists to the property. A short plat of up to four new lots/homes with irrigated lawns is the maximum number that the Health District will certify could be served by a new group exempt well if separate irrigation water were not available (4 x 1250 = 5000). No more than ½ acre of lawn or garden per parcel/home would be eligible for irrigation, as stipulated in RCW 90.44.050.

<sup>4</sup> In accordance with the State Supreme Court Decision in Ecology v. Campell and Gwinn, LLC (March 28, 2002), the Health District adopted policy (November 18, 2002) stating that each single family residential unit shall be considered to utilize 800 gallons of water per day, in the event that separate irrigation water exists to the property. A long plat/subdivision of up to six new lots/homes is the maximum number that the Health District will certify could be served by a new group exempt well if separate irrigation water is available (6 x 800 = 4800).

subdivisions - five or more lots)	Building and Planning Department; County Assessor's Office	subdivisions; assignment of new parcel numbers to final long plat and subdivision lots.	Department excel database and Assessor's AS400 database.	via a long plat/subdivision may be served by a group exempt well; <i>combined use</i> may not exceed 5000 gpd. Since 1995, policy states that wells must be in place for a subdivision to be finalized.
	Chelan-Douglas Health District	Certification of potable water via issuance of onsite sewage permits; Group A and B well information.	Chelan-Douglas Health District database(s).	The Chelan-Douglas Health District certifies that potable water is available (see footnote 1) as part of the onsite sewage permitting process. For subdivisions involving more than six new lots, a Group A or B well connection is required.
	Ecology Water Resources Program	Well logs created by commercial drilling companies are required to be submitted to Ecology; Issuance of new water rights	Ecology well log database; Water Rights Tracking System (WRATS); Geographic Water Information System (GWIS)	If a new long plat/subdivision qualifies for a group exempt well, the well is dug through use of a drilling contractor, and the well log is properly submitted to Ecology, it will be recorded in their database. If the subdivision homes require irrigation water, proof of existing irrigation water from another source/a water right will be needed.

## APPENDIX H. ENTIAT EFFECTIVENESS MONITORING STUDY

### MONITORING THE EFFECTIVENESS OF HABITAT RESTORATION ACTIONS IN THE LOWER ENTIAT RIVER

Prepared by  
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August 11, 2005

The Entiat Effectiveness Monitoring Study will measure the extent to which the Bridge-to-Bridge Habitat Restoration Project in the lower Entiat River affects (a) fish habitat, (b) fish habitat utilization, and (c) the productivity of salmonid fishes in the Entiat Subbasin, and 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 landowners and the local Watershed Planning Unit are built into this Study design.

Ideally, the Study will be implemented over a 10 year period. This duration is dependent upon funding. To start, a minimum of five years participation has been solicited from willing private landowners. An extended monitoring time frame is necessary to account for at least two salmonid generations (4-5 years per generation), to capture pre and post-restoration project conditions, interannual variability, long-term channel adjustments resulting from the restoration project, and possible changes to restoration project features that might arise from periodic factors like large runoff events.

This Study capitalizes on the unique effectiveness monitoring opportunity in the Entiat Subbasin. The Entiat Bridge-to-Bridge Project is sufficiently large and designed to help fix the appropriate salmon habitat limiting factors. It will likely provide measurable contributions to fish habitat, habitat utilization, and the productivity of salmonids in the Entiat Subbasin. Furthermore, this discrete reach restoration effort is generally not confounded by other actions and land use impacts to the extent found in other Subbasins. Finally, this Study firmly places monitoring within the Entiat Subbasin in the framework described by the *Monitoring Strategy for the Upper Columbia Basin*, and helps implement monitoring actions recommended in the Entiat watershed plan (CCCD 2004).

The initial implementation of this study is being funded primarily by the Bonneville Power Administration (BPA) through a project managed by National Oceanic and Atmospheric Administration (NOAA). This larger project, called the Integrated Status and Effectiveness Monitoring Program (ISEMP), is designed to suggest better ways to monitor the status and trends of fish and their habitats as well as the effectiveness of fish restoration measures. In the Entiat, additional data is being collected by cooperating agencies (see Table 6) under separate funding.

Table 6. A description of several study elements of the Entiat Effectiveness Monitoring Study.

Study Element - Initial Study Period (2005-2007)	Description
1) Coordination	Chelan County Conservation District will coordinate: the implementation of the restoration project; landowner and Planning Unit outreach; and annual project reporting.
2) Data synthesis and technical reporting	The monitoring results of all indicators (elements 3 through 9) will be synthesized into a final report at the end of the three year initial study period to describe initial results of the Entiat Effectiveness Monitoring Study.
3) Performance Monitoring	Chelan County Conservation District will coordinate landowner outreach to enable USFWS and UCSRB RTT monitoring partners to establish longitudinal and cross-sectional stream profiles at treatment and control sites with the specific intent to monitor physical changes in the stream channel resulting from restoration project actions. These surveys will elucidate the mechanistic steps between action and resultant physical change but are unsuited for use in biological monitoring. These surveys will also help with adaptive design of future actions.
4) Parr/Juvenile/Adult habitat use	USFWS will conduct the monitoring of parr/juvenile/adult fish use of habitat within Project treatment and control reaches through seasonal (3 times/year) snorkeling observations.
5) Habitat conditions, channel conditions, riparian conditions, and macroinvertebrate sampling	Protocols described in the Upper Columbia Monitoring Strategy (Hillman 2004) will be used to evaluate treatment and control reaches to explain confounding sources of variability in the fish habitat use data. Complete protocols will be implemented once per year in coordination with the late-July snorkel survey. Two additional habitat surveys of limited scope will be conducted to support snorkel surveys in late February and November.
6) Adults and redds	Historical and on-going surveys of adult/redd abundance and distribution will continue to be implemented throughout the spawning range of target species, including the treatment and control portions of the Project area. Funding for these surveys by USFWS (bull trout, steelhead, spring, summer) are secure.
7) Smolts	USFWS began operation of a smolt trap upstream of the treatment reach in 2004 and will continue this operation indefinitely. Funding for the operation of this trap is secure. No additional funding is needed for this indicator during the initial three year study phase. Additional smolt trapping may be considered depending on the species and life stages found to use new habitat within the treatment reach.
8) Stream flow and water temperature	USFS maintains a longitudinal network of automated thermometers throughout the mainstem Entiat River including meters near treatment and control reaches. USGS maintains three stream gages in the watershed, one near the treatment reach and one in the uppermost control reach. Additional automated thermometers may be deployed by the USFWS at specific monitoring locations.
9) Landscape Classification	Landscape classification required for effectiveness monitoring under the Upper Columbia Monitoring Strategy has been completed by UCSRB and ISEMP.

Background: In 2005, the Chelan County Conservation District (CCCD) on behalf of the Entiat Watershed Planning Unit (EWPU) will begin construction of what may be the largest reach-scale habitat restoration project currently being implemented in the Upper Columbia Basin. This project, known as the “Entiat Bridge-to-Bridge Project” (Project), is funded by Washington Salmon Recovery Funding Board (SRFB) and includes the rewatering and reconnection of relict stream channels with the main river channel, stream grade control, placement of in-stream structures, and riparian planting – all to occur within 1.2 miles of the Entiat River from river mile 3.2 to river mile 4.4. The riparian planting element of the Project will begin in 2005, while the instream structure and side-channel work is scheduled to begin in 2006. The Project addresses what the Upper Columbia Regional Technical Team (RTT) considers to be the primary limiting factor in the lower Entiat – channel complexity– and this project implements one of four simultaneous actions recommended in the RTT’s *Upper Columbia Biological Strategy* – “restore habitat diversity and channel function” in the lower river. The Bridge-to-Bridge project is anticipated to increase adult holding habitat, juvenile rearing habitat, and spawning habitat for salmonid species, of which steelhead, spring and summer Chinook salmon, and bull trout may be affected. For instance, the Project intends to increase pool densities from 0.3 to 9.0 pools per mile in an area used by each of these species currently under some level of federal or state protection.

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. The UCSRB RTT and NOAA Fisheries have identified the construction of this Project as an excellent opportunity to implement an effectiveness monitoring study for several reasons:

Opportunity 1) the Entiat Bridge-to-Bridge Project is sufficiently large and targeted to the appropriate limiting factors that it may provide measurable contributions to fish habitat, habitat utilization, and the productivity of salmonids in the Entiat Subbasin,

Opportunity 2) the RTT and NOAA Fisheries have recently developed a *Monitoring Strategy for the Upper Columbia Basin* which provides a framework for measuring the effectiveness of projects like the Entiat Bridge-to-Bridge Project,

Opportunity 3) monitoring efforts in the Entiat Subbasin by multiple agencies, including U.S. Fish and Wildlife (USFWS), CCCD, and U.S. Forest Service (USFS), are currently being implemented in a way that could be easily structured into a focused effectiveness monitoring study, and

Opportunity 4) the additional resources necessary to coordinate and complete an scientifically-sound effectiveness monitoring study are relatively modest.

The Entiat Watershed Planning Unit supports this effort because effectiveness monitoring was recommended in the Entiat watershed plan, and is complementary to other ongoing actions. This study will provide valuable information to the EWPU and enable the community to track habitat restoration results and revise strategies, if necessary.

Proposed Entiat Effectiveness Monitoring Study: The RTT, in conjunction with CCCD and other cooperating agencies, proposes an effectiveness monitoring study (Study) for the Bridge-to-Bridge Project that would:

Objective 1) measure the extent to which the Project affects (a) fish habitat, (b) fish habitat utilization, and (c) the productivity for salmonid fishes of the Entiat Subbasin, and

Objective 2) test aspects of the *Monitoring Strategy for the Upper Columbia Basin* that pertain to effectiveness monitoring.

The Study will monitor treatment and control reaches of the Entiat Subbasin, and utilize an ecological landscape classification system that has been recently developed (by BPA and Upper Columbia Salmon Recovery Board) to support effectiveness monitoring, and quantify Project-related changes in several indicators:

Indicator 1) the abundance and distribution of spawning adult steelhead, chinook salmon, and bull trout,

Indicator 2) the complexity of the physical habitat structure (habitat conditions, channel conditions, riparian conditions, and macroinvertebrate community structure) within the Project-area;

Indicator 3) stream flow and water temperature;

Indicator 4) adult and juvenile fish habitat utilization; and

Indicator 5) the number/size of outmigrating juvenile salmonids.

The initial phase of the proposed study would span a three-year time period, beginning in 2005 prior to implementation of the Bridge-to-Bridge Project, and continue through the 2007 field season as the phased Project is implemented. Complete answers to the more challenging research questions (e.g. how has the Project affected salmonid productivity) would likely take at least 10 years (i.e. at least two salmonid generations) to answer, however, continuation of monitoring beyond 2007 is contingent upon funding and ongoing landowner permission and partnership in this effort.

## Study Element Details

### Survey Sites and Experimental Design

The basic experimental design used for this study is a modified Before-After/Control-Impact design as reviewed in Hillman (2004). Fish and habitat surveys will be conducted at three sites proposed to be treated with new restoration actions in the next few years, and at six sites composed of two types of experimental controls. (Experimental controls are used to provide a baseline against which treated sites can be compared.) We used the Upper Columbia ecological landscape classification system to refine locations of control sites so that general habitat conditions at control and treatment sites are similar.

One set of three experimental controls (which we call “untreated” controls) have been located at sites where no restoration work is anticipated in the near future (5+ years). These sites should change very little during the course of the study and should represent the relatively depressed conditions existing in much of the lower river. The second set of three experimental controls (which we call “preexisting” controls) have been located at sites where restoration treatments have already been completed and are currently providing benefits to fish. These sites also should change very little during the course of the study but should reflect the types of conditions (e.g. complex channels, higher fish densities) that we expect with completed treatments. The way we intend to compare each of these three types of sites is illustrated in Figure 1.

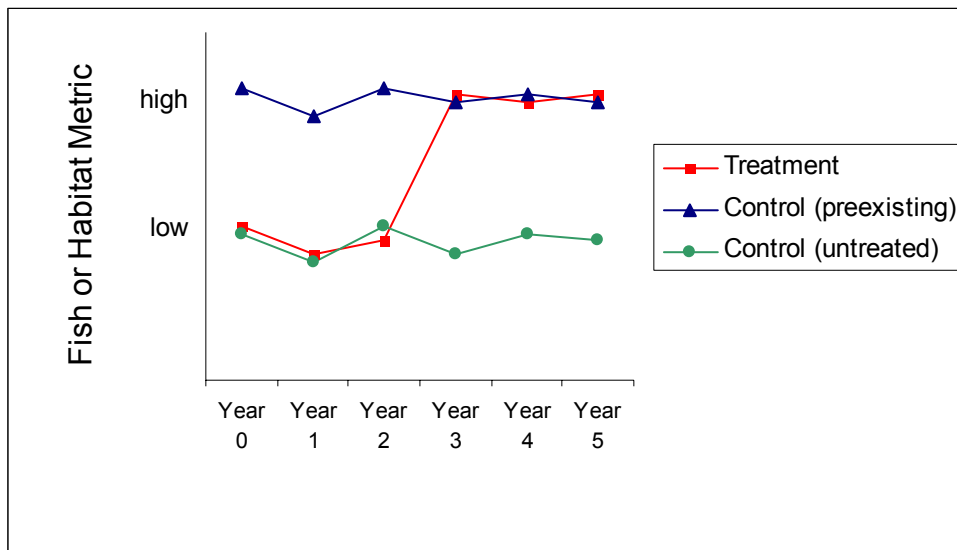


Figure 1. Hypothesized responses of fish or habitat metrics (e.g. fish densities or pool areas, etc.) at three types of study sites. This figure assumes that habitat work is done at the treatment sites after surveys in Year 2. It also assumes that habitat work was done at preexisting control sites prior to Year 0. It also assumes an immediate, persistent response to restoration treatments.

At each sample site, we will survey all possible fish habitat such as main channels and side channels. This includes irrigation canals and fish bypass channels where they abut our sample sites (as they do at 4 sites: the PUD irrigation canal, Knapp-Wham diversion, Hanan-Detwiler, and restored side channel below the hatchery road). In addition to showing us the full picture of fish use at the adjacent treatment or control sites, information collected in the fish

bypass reaches at these diversions has the added benefit of being useful for before-after comparisons in the event that future work is conducted at these diversion sites.

Finally, in addition to the sites in the treatment and control areas in the lower river, we are sampling 10 sites randomly located within the fish bearing portions of the Entiat River watershed to discern possible watershed-scale signals that could confound our lower-river experiment. According to the *Monitoring Strategy for the Upper Columbia Basin*, we would ideally be sampling 50 such randomly located sites but were unable to afford that level of effort in this initial year. We hope that other agency cooperators may be able to fill this gap in subsequent years. In addition to implementing *Monitoring Strategy* habitat protocols at these sites, we are also conducting tests of different monitoring approaches as part of the larger ISEMP program.

### **Survey Area**

All treatment and control sites are located in a relatively short stretch of the Entiat River from river mile 3 to RM 7. Each site is 200 meters long and is benchmarked with flagging, rebar, and fence posts. Benchmarks have been mapped and flagged at the mid-point and end-points of each sampling unit and coordinates will be taken by GPS. At this time, only one treatment site has been benchmarked because the specific sites where the next two Bridge-to-Bridge treatments will occur have not yet been finalized. It is anticipated that this will be determined by summer 2006. Once the additional two project sites are identified, monitoring data collection will be started at these locations.

MAP

### **Survey Period**

Streamflow in the Entiat River can vary greatly and strongly influence the timing of surveys. Data obtained from the U.S Geological Survey (USGS) station near the mouth of the Entiat River (mean daily values for 1997-2003) shows minimum flows of 156 cfs in February and maximum flows of 2183 cfs in June (USGS 2003). Previous surveying efforts in the Entiat River by NRCS staff have indicated that when flows are >200 cfs, it is difficult to safely wade across the river, and USFWS staff have indicated that flows >400 cfs are difficult to be effectively or safely snorkeled. Therefore, our monitoring schedule must be somewhat flexible according to flow and water visibility conditions. Favorable snorkeling conditions of  $\leq 400$  cfs flow can be expected, on average, to occur between late July and April. The timing of habitat survey work that requires wading will be dependent upon safe wading flows, which usually start to occur in August.

We plan to survey the randomly selected sampling units in the treatment and control reaches three times annually (approximately every four months). The first surveys began early August, 2005 (but may be conducted in July in subsequent years if flow conditions allow). The second survey period will occur in late October/early November. The third survey period will occur in late February to early March.

Complete snorkel surveys will be conducted during each of three sampling periods. Intensive surveys of habitat conditions, channel conditions, and riparian conditions will be conducted once per year in coordination with the July/August snorkel survey following protocols described in the *Upper Columbia Monitoring Strategy* (Hillman 2004). Two additional habitat surveys of limited scope will be conducted to support snorkel surveys in November and late



February; during these surveys, basic channel dimensions (e.g. bankfull width, wetted widths, side channel dimensions and connections with the main channel) and snorkel survey benchmarks will be mapped and measured as will pool area and pool depths. Large woody debris and other longitudinal metrics will also be counted. Continuously recording water temperature meters will be deployed in treatment and control reaches and will be downloaded monthly.

### **Sampling Guidelines**

Snorkel Surveys: Fish will be surveyed by direct observation using single-pass daytime and nighttime snorkeling per Hillman (2004). Up to five snorkelers will conduct the surveys in the mainstem river sampling units. The irrigation canal will be surveyed by two snorkelers. Up to five snorkelers may be needed to survey the re-established off channel habitat depending on the dimensions and complexity of that unit. Survey crews will enter the downstream end of the designated sampling unit and snorkel in an upstream direction to the end of that unit. Glow sticks or other visible markers will be affixed near the applicable benchmarks prior to each survey to assist crews in determining length of each sample unit.

All USFWS staff involved with this survey work will have prior nighttime snorkeling experience. All snorkeling will be done in dry suits to maximize comfort. Snorkelers will use hand-held Halogen lights to illuminate their respective survey area. Data will be recorded by each diver on a PVC cuff secured to their arm. Prior to surveying a sample unit, a measure of underwater visibility will be done using a salmonid silhouette. The maximum distance at which marks (i.e. parr-like) on the silhouette are visible will be recorded. This distance must be sufficient to clearly survey the areas between each snorkeler and/or between snorkeler and the stream bank. Water temperature will be taken at the start of each survey.

All fish observed will be counted by species and assigned to a size/age class. Fish densities are tallied separately by habitat unit within each site.

Habitat Surveys: Surveys of habitat conditions, channel conditions, and riparian conditions will be conducted following protocols described in the Upper Columbia Monitoring Strategy (Hillman 2004) by staff previously trained and experienced in using these protocols. Macroinvertebrate (aquatic insect) communities will be sampled at each sample site per Hillman (2004).

### **References**

CCCD. 2004. Entiat Water Resource Inventory Area (WRIA) 46 Management Plan. October 2004. Prepared for the Entiat Watershed Planning Unit by the Chelan County Conservation District. Wenatchee, Washington.

Hillman, T.W. 2004. Monitoring strategy for the Upper Columbia Basin: Draft report February 1, 2004. Prepared for Upper Columbia Regional Technical Team, Wenatchee, Washington.

## APPENDIX I - LETTERS OF SUPPORT



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

15 West Yakima Avenue, Suite 200 • Yakima, Washington 98902-3452 • (509) 575-2490

May 14, 2004

Entiat WRIA Planning Unit  
c/o Phil Jones and Sarah Walker, Planning Unit Co-Coordinator  
Chelan County Conservation District  
301 Yakima Street, Room 307  
Wenatchee, WA 98801

RE: Letter of Support for the Entiat WRIA Management Plan

Dear Mr. Jones and Mrs. Walker:

It is my honor to write you today on behalf of all the state natural resource management agencies expressing support for the Entiat WRIA Management Plan. This letter is your record of the State "speaking with one voice" as committed to you via letter of Governor Locke, dated June 24, 1999 (attached), consistent with the interagency Memorandum of Understanding (MOU), dated September 21, 1998, and the procedures of the Upper Columbia Caucus of State Agencies.

On May 5<sup>th</sup> the Upper Columbia Caucus of State Agencies (caucus, see cc list) voted to support implementation of the Entiat WRIA Management Plan, and to support clarification of certain plan attributes. In addition to voting favorably on the overall watershed plan, the caucus voted to:

- (1) Support the establishment of a 5 cubic foot per second (cfs) reserve, senior to recommended instream flows;
- (2) Specify that the agricultural and industrial reserve water be made available in the lower Entiat River (river mile 0 to 16.2, monitored at the USGS "Entiat Near Entiat" gauge) thereby protecting the biologically sensitive and important "stillwater" reach; and
- (3) Support the recommendation that instream flows be established with a priority date of the rule adoption date.

During the caucus vote, one of my caucus colleagues made a remark that I believe speaks well of the Entiat WRIA Planning Unit, and reflects the sentiment of the caucus as a



Phil Jones  
Sarah Walker  
May 14, 2004  
Page 2 of 2

whole. He stated: "It is imperative that we (the State) support this planning unit. Nowhere else is there such a dedicated and cohesive unit working toward sustainable watershed management." We encourage you to remain the dedicated and cohesive unit you are as you move from organization, assessment, and plan development into implementation. We look forward to working with you and agree to provide support as you proceed.

Most Sincerely,



John T. Monahan  
Watershed Lead, Department of Ecology and  
Representative, Upper Columbia Caucus of State Agencies

JTM:de  
040508

cc: Carmen Andonaegui, WA Conservation Commission (former representative)  
Dennis Beich, WA Dept of Fish and Wildlife  
Clayton Belmont, WA Dept of Transportation  
Bob Bugert, Governor's Salmon Recovery Office  
Linda Crerar, WA Dept of Agriculture  
Jim Fox, Interagency Committee for Outdoor Recreation  
Megan Harding, WA Dept of Health  
Hal Hart, Office of Community Development (formerly CTED)  
Bill Jolly, WA Parks and Recreation Dept  
Dick Wedin, WA Dept of Natural Resources

GARY LOCKE  
Governor

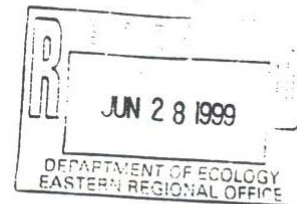


STATE OF WASHINGTON  
OFFICE OF THE GOVERNOR

P.O. Box 40002 • Olympia, Washington 98504-0002 • (360) 753-6780 • TTY/TDD (360) 753-6466

June 24, 1999

Mr. Philip J. Jones, Coordinator  
Entiat Watershed Study  
Chelan County Conservation District  
301 Yakima Street, Rm 307  
Wenatchee, WA 98801



Dear Mr. Jones:

Thank you for your letter requesting state agency participation on the Entiat Watershed Planning Unit as provided for in the Watershed Planning Act. I commend you on the progress you have already made in your watershed planning effort, as illustrated by the Draft Cooperative Resource Management Plan (CRMP), and the associated watershed process. I hope this process will build upon the solid foundation laid by the CRMP.

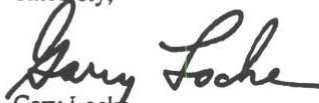
I appreciate the care that the Entiat Initiating Governments have taken in ensuring that this watershed process is as inclusive as possible. I am pleased that you have invited the Colville Confederated Tribes and the Confederated Tribes and Bands of the Yakama Indian Nation to participate. As you move further along in the process, I encourage you to consider adding members, as needed. I assure you that the state is making every effort to support the Entiat in providing continuity in its efforts in a cooperative and collaborative manner.

Twelve state natural resource agencies have agreed upon principles and procedures they will follow in working with local planning units. These agencies will cooperate to improve the state's contributions to watershed planning. John Monahan of the Department of Ecology will oversee the activities of the Entiat area caucus of state agency representatives as they work in a central role to identify situations in which coordinated state action is needed.

Although other agencies were unable to commit to direct involvement, each will provide information to support the planning process, and will coordinate their efforts through the state caucus. John Monahan, as watershed lead, will assist formal communications with these agencies and is authorized to speak on their behalf.

Again, thank you for contacting me. I wish you success in this extremely important undertaking.

Sincerely,

  
Gary Locke  
Governor

cc: 12<sup>th</sup> Legislative District  
John Monahan, Department of Ecology





Confederated Tribes and Bands  
of the Yakama Nation

Established by the  
Treaty of June 9, 1855

May 14, 2004

To the Chair and members of the Entiat WRIA Planning Unit

The Yakama Nation supports approval of the Entiat Watershed Plan and this letter serves to clarify our meaning in casting a vote in support of the plan.

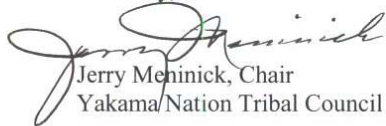
It has been a pleasure working with the members of the Planning Unit on this project. The Entiat Planning Unit should serve as an example of cooperation for other planning groups in the region. We hope that the spirit of cooperation and openness will continue through the implementation phase.

In supporting the Plan, we intend to help secure funding to implement habitat improvements, improvements in instream flow and other beneficial components of the Plan and ensure they are implemented for the benefit of the resource we all share. The plan is a complex document with many parts moving according to different schedules. We view the Plan as a package that addresses needs of both instream and out of stream resources. It is our intention that the benefits to all resources be realized through the implementation phase. We support the proposal for DOE to adopt the recommended Administrative Instream Flows. We are not entirely supportive of the potential use of exotic biological agents to control noxious weeds. We support the recommendation that Chelan County adopt and implement the Plan.

The Yakama Nation reserves all rights and remedies at its disposal. Neither the Entiat Watershed Plan nor the Yakama Nation's support for the plan may be construed to waive, abrogate, diminish, define or interpret the Treaty rights of the Yakama Nation. By casting this supporting vote for the Entiat Watershed Plan, the Yakama Nation does not waive its sovereign immunity.

We appreciate all your efforts and look forward to continuing to work to improve the resources of the Entiat Watershed.

Sincerely,

  
Jerry Meninick, Chair  
Yakama Nation Tribal Council

Post Office Box 151, Fort Road, Toppenish, WA 98948 (509) 865-5121



United States  
Department of  
Agriculture

Forest  
Service

R-6

OR/WA

Bureau of Land  
Management

United States  
Department of  
Interior

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**Reply Refer To:** (FS)/ (BLM) (OR-) Wenatchec/Okanogan N.F. Wenatchee BLM Field Office

Dear Entiat Planning Unit:

May 17, 2004

The 2004 Entiat Water Resource Inventory Area (WRIA 46) Final Draft Management Plan (WRIA 46 Plan) presents the results of more than ten years of collaborative work by the Entiat Watershed Planning Unit (formerly Entiat Coordinated Resource Management Planning [CRMP] Group). The WRIA 46 Plan addresses all analysis components in the Washington State Watershed Planning Act – the required element of water quantity (water budget), as well as the optional elements of instream flow, habitat, and water quality. The WRIA 46 Plan presents recommendations for managing, maintaining, restoring, and monitoring the resources of the Entiat subbasin and has benefitted from considerable technical input from Forest Service and Bureau of Land Management staff and specialists. For these reasons, The WRIA 46 Plan has been envisioned as a third iteration of Federal watershed assessment for the Entiat Analysis Area. The first iteration (Version 1.0) was completed in February, 1995 with a primary focus on Tye Fire recovery. The second iteration of Federal assessment (Version 2.0, April 1996) updated Version 1.0 and addressed new issues related to recreation, commercial grazing and the Columbia River Tributaries adjacent to the Entiat subbasin.

The second iteration of watershed assessment for Federal lands in the Entiat subbasin (Entiat WA V2.0) was completed in concert with the CRMP phase of cooperative planning effort for the Entiat led by the Chelan County Conservation District (CCCD). The WRIA 46 Plan is the culmination of that parallel watershed analysis effort focusing on watershed management issues associated with the private lands in WRIA 46. However, successful development of the WRIA 46 Plan has involved a total watershed view, with cooperating agencies providing support and information from their respective analyses (Entiat WA V2.0, page 4).

WRIA 46 Plan development did not rigidly follow the original eight-step Federal Agency Guide to Watershed Analysis process as was utilized by Versions 1.0 and 2.0. Other more relevant analysis processes were employed by the Planning Unit, including:

- **Coordinated Resource Management Planning** process (USDA Forest Service, USDA Soil Conservation Service, USDI Bureau of Indian Affairs, USDI Bureau of Land Management, Washington State Departments of Natural Resources and Wildlife, Washington State Conservation Commission, Washington State Cooperative Extension, and Washington Rangelands Committee, 1993)
- **Instream Flow Incremental Methodology** (Stalnaker, Lamb, Henriksen, Bovee, and Bartholow, 1995)

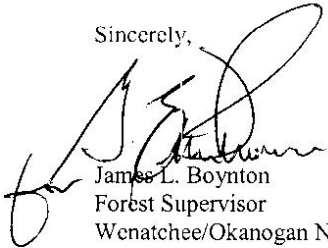
- **Washington State Watershed Planning Act** (ESHB 2514, 1998) and **Salmon Recovery Management Act** (ESHB 2496, 1998)

The above processes are excellent surrogates for the eight-step Federal process. The steps of the Instream Flow Incremental Methodology (problem identification, study planning, study implementation, alternatives development, and problem resolution) are particularly well suited to address social issues as well as technical issues. An acknowledged shortcoming of Entiat WA V2.0 (page 3) was that it did not extensively address social issues, instead deferring major consideration of social issues to the Cooperative Watershed Management Planning effort that produced this WRIA 46 Plan. Accordingly, this WRIA 46 Plan meets the intent (if not the procedures) of the eight-step Federal process.

Watershed analysis is ecosystem analysis at the watershed scale, and is one of the principle means by which ecosystem management goals will be met. Information contained in the WRIA 46 Plan will be used to identify management strategies, design monitoring programs and develop restoration projects for the mutual benefit of private and public landowners and managers. A particularly relevant and recent example of a favorable outcome of this process is WDOE's recommendation to the USEPA that WRIA 46 *not* be placed on the 2002/2004 303(d) list for temperature, but rather receive a "4b" categorization – impaired but has a pollution control plan – as a result of the Planning Unit's past and current efforts to address exceedances of water temperature standards. This Plan is not a decision-making document; however, it does provide a sound basis for developing specific projects and conducting site-specific (SEPA/NEPA) analysis. In addition, the WRIA 46 Plan provides a broad foundation for future iterations of Entiat watershed assessment and Forest Plan revisions.

I am pleased to recommend approval of the WRIA 46 Plan and its adoption as Version 2.5 of the Watershed Assessment of the Entiat Analysis Area, Okanogan and Wenatchee National Forests. I look forward to the continued participation of the Forest Service and Bureau of Land Management in achieving the mission and goals envisioned by this significant collaborative effort.

Sincerely,



James L. Boynton  
Forest Supervisor  
Wenatchee/Okanogan National Forest  
US Forest Service



James F. Fisher  
Field Manager  
Wenatchee Resource Area  
Bureau of Land Management



United States Department of the Interior  
Fish and Wildlife Service  
Mid-Columbia River Fishery Resource Office  
7501 Icicle Road  
Leavenworth, WA 98826  
Phone: (509) 548-7573  
Fax: (509) 548-5743



May 17, 2004

Entiat Watershed Planning Unit  
c/o Sarah M. Walker  
Entiat Watershed Project Co-Coordinator  
301 Yakima Street, Room 307  
Wenatchee, WA 98801

Dear Ms. Walker:

The U.S. Fish and Wildlife Service (Service) commends the Entiat Watershed Planning Unit (EWPU) on the culmination of 10 years of work. The EWPU in coordination with the Federal, State, Tribal, County and local participation has completed the Final Draft 2004 Entiat Watershed Resource Inventory (WRIA 46) Management Plan (Plan). The Plan addresses all of the components of the Washington State Watershed Planning Act including a water budget, water quality, instream flow and habitats associated with fish and wildlife species. Additionally, the Plan presents management recommendations for protection, enhancement, restoration and monitoring of natural resources within the Entiat Subbain.

The Service recommends the adoption and approval of the Plan by the EWPU and we look forward to continued participation in achieving the mission and goals envisioned by this significant collaborative effort. If you have any questions or comments concerning the Service's participation in this effort, please contact Kate Terrell of my staff.

Sincerely,

*bc* Brian Cates  
Project Leader





**PUBLIC UTILITY DISTRICT NO. 1 of CHELAN COUNTY**  
P.O. Box 1231, Wenatchee, WA 98807-1231 • 327 N. Wenatchee Ave., Wenatchee, WA 98801  
(509) 663-8121 • Toll free 1-888-663-8121 • [www.chelanpud.org](http://www.chelanpud.org)

May 6, 2004

Entiat WRIA Planning Unit  
c/o Sarah M. Walker  
Entiat Watershed Project Co-Coordinator  
Chelan County Conservation District  
301 Yakima Street, Room 307  
Wenatchee, WA 98801

Dear Ms. Walker:

The Chelan County PUD Board of Commissioners would like to congratulate the Entiat WRIA Planning Unit on its achievement of a watershed management plan that protects and restores fish habitat while considering future community and economic growth. As Commissioners of a utility with environmental stewardship responsibility, we understand the significant work involved in development of a plan that successfully balances resource needs with other interests in an approach that enjoys broad support.

One of the most impressive aspects of the EWPU's plan is the level of involvement from the Entiat community. We view stakeholder participation as a critical component of developing workable long-term solutions, and we believe that citizens volunteers deserve recognition for their invested time and energy. The EWPU plan is an excellent testament to successful coordination among citizens and representatives of federal, state and local governments.

The plan has been reviewed by Chelan PUD fish and wildlife staff, who found the proposed measures biologically sound and capable of protecting and enhancing habitat for a variety of species, particularly spawning and juvenile salmon. Moreover, the types of projects proposed in the plan are likely to complement the efforts of the District's own Habitat Conservation Plan.

We understand that the EPWU will be voting on final approval of the plan on May 17 before submitting it to Chelan County. We support this plan and will direct the District's representative to vote in favor of the final plan content at the May meeting.

Again, we extend our congratulations to those who crafted this document. We hope it will serve as an example for other watersheds undertaking this significant task.

Sincerely,

David Pflugrath, President

## APPENDIX J - POTENTIAL FUNDING SOURCES

**NOTE:** This list is by no means exhaustive, but a summary of annually available grants. Many more grant sources are available through the Boise State University Environmental Finance Center Directory of Watershed Resources, online at: <http://efc.boisestate.edu/>

Agency	Grant/Loan Programs	Eligible Projects	Award	Match Requirement	Eligible Applicants
U.S. Fish & Wildlife Service	North American Wetlands Conservation Grant Program (NAWCA)	Acquisition and restoration projects to help wetland ecosystems and habitat for migratory birds and other fish & wildlife species.	Up to \$1 M	50% match	Nonprofits, individuals, local governments
	Private Stewardship Grant Program	On-the-ground restoration projects on private lands benefiting endangered, threatened, candidate and other at risk species.	Up to \$300,000; average \$70,000	10% cost share	Nonprofits, groups, individuals, local governments
WA Interagency Committee for Outdoor Recreation	Aquatic Lands Enhancement Account	Acquisition, restoration, and public access projects benefiting wildlife habitat and aquatic conservation in waterfront areas.	Up to \$1,000,000	50% cost share	State, local, and tribal governments
WA Interagency Committee for Outdoor Recreation	Family Forest Fish Passage	Financial assistance to small forest landowners to repair or remove fish barriers on their properties.	\$50,000	Up to 25% cost share	Small forest landowners
WA Interagency Committee for Outdoor Recreation	Salmon Recovery Funding Board	Salmon recovery projects including habitat protection and restoration, passage barrier removal, road decommissioning, some planning and studies.	Up to \$1,000,000	15 % cost share	Nonprofits, local, state, and tribal governments, businesses
National Fish and Wildlife Foundation	General Matching Grant program	Restoration or stewardship projects addressing wildlife and habitat restoration/conservation	Average \$100,000 – \$150,000	20% nonfederal match	Nonprofits, state, local, and tribal governments.
U.S. Environmental Protection Agency	Environmental Education Grants	Environmental education, training, and outreach	Up to \$50,000; average under \$15,000	25% cost share	Universities, state, local, and tribal education agencies, nonprofits

Agency	Grant/Loan Programs	Eligible Projects	Award	Match Requirement	Eligible Applicants
WA Department of Ecology	Centennial Clean Water Fund grants Section 319 Nonpoint Source Grants	Water pollution control projects including riparian habitat restoration, water quality studies, outreach and education, lake watershed monitoring, and water quality pilot projects.	Up to \$500,000	25% cost share	State, local, and tribal governments, nonprofits
WA Department of Fish & Wildlife	Landowner Incentive Program	Protection, enhancement, or restoration of habitat to benefit "species-at-risk" on privately owned lands.	Up to \$50,000 (no funding available this year)	25% cost share	Individual landowners, governments and organizations applying on behalf of landowners
National Fish and Wildlife Foundation	Community Salmon Fund	Community-based salmon habitat restoration projects with a focus on working with private landowners.	Usually up to \$50,000	50% match	Nonprofits, state, local, and tribal governments
USDA Natural Resources Conservation Service	Wildlife Habitat Incentive Program	Restoration of wildlife habitat on private property including uplands, wetlands, threatened and endangered species habitat, and fish habitat.	Usually under \$50,000	25% cost share	Individual landowners, governments and organizations applying on behalf of landowners
USDA Natural Resources Conservation Service	Environmental Quality Incentive Program	Funding for on-farm improvements including irrigation water, pest, and nutrient management; fencing, off-site watering, etc.	variable depending on practices installed	variable	Individual landowners, governments and organizations applying on behalf of landowners

## APPENDIX K - FINAL DRAFT DIP COMMENTS AND RESPONSES

A first draft of the Entiat Detailed Implementation Plan was distributed to Entiat Watershed Planning Unit members and placed on the Chelan County Conservation District website for review and comment on December 7, 2005. Landowner Steering Committee (LSC), Technical Advisory Subcommittee, and other Entiat Watershed Planning Unit (EWPU) members discussed first draft content during the January 4, 2006 EWPU meeting. The general public comment period concluded on January 15; no comments from the public were received.

Subsequent to the January 4 EWPU meeting, two work sessions were held to refine DIP content and solicit additional feedback from EWPU members. An Entiat technical subcommittee meeting was held on January 19, and a meeting with LSC members was held on January 26. Discussion with Ecology staff regarding required elements and compliance with the Watershed Planning Act (Chapter 90.92 RCW) also occurred. Primary changes that were recommended included:

- Adding additional clarity around near-term tasks and milestones;
- Quantifying the number of municipal water systems and inchoate rights, and describing the relationship between Chapter 173-546 WAC and potential expansion of municipal systems;
- Assigning lead roles to tasks, if/when appropriate;
- Including caveats related to the long-term implementation schedule, agency roles and funding uncertainties;
- Providing detail on research and monitoring priorities.

Edits and additions to the first draft Entiat Detailed Implementation Plan were made to address the comments that were provided via meetings, phone conversations, and other mechanisms, and a final draft of the Entiat DIP was released for public review on February 3, 2006. Written notice that the final draft DIP would be available for comment online at the Conservation District website after 5 p.m. on February 3 through February 15 was mailed out to all EWPU minutes recipients (approximately 130 people including agency, tribal, non-government staffs and other stakeholders) on January 27<sup>th</sup>. Information about DIP availability and the comment period was also emailed to members of the EWPU and others on February 6<sup>th</sup>.

All comments received on the final draft DIP were submitted via email. A summary of the comments received and responses is provided on the following pages. Numbers at the end of each comment relate to the commenter. A complete list of commenters is found immediately following the comment/response section.

All comments have been listed; however, general comments of support are included without a response. Following all other comments, responses are provided in plain text and/or bulleted italicized text.

- *Bulleted italicized responses describe what changes have been made to the implementation plan, and where they have been made.*

**General Support:**

Great job (1); I appreciate all the hard work that was put into this plan (2); There were no outstanding issues or surprises, which is a testament to regular communication, meetings and updates, congratulations! (3); Congratulations on a job well done (4); This all looks good to me....Again - a great job (6).

**Comment:** (1)

I agree with the intra-assessment unit prioritization [pages 13-15] and appreciate the additional detail. This is consistent with the draft Upper Columbia Salmon Recovery Plan (UCSRB 2005). The habitat improvements outlined as part of the Early Implementation Actions (Table 7) will benefit abundance, productivity, spatial structure and diversity as described in the UCSRP. Perhaps a clear link (to VSP) in Table 8 may or may not be appropriate.

**Response:**

Thank you for your support of the additional level of biologic prioritization detail that we attempted to provide to readers.

- *Additional text has been added to the bullet on page 44 that describes the “Project Type” column in Table 8 so that the reader is aware they may refer to Appendix G (Habitat Matrices) of the draft Upper Columbia Salmon Recovery Plan (UCSRB 2005), which identifies how each project type (Restoration Class) will benefit Viable Salmonid Population (VSP) criteria.*

**Comment:** (1)

[On page 30] It is not clear how/where the duplication is eliminated? How does the citizens committee under the Salmon Recovery Act (2496) work differently with the planning unit throughout implementation? If things stay the same does it really eliminate duplication?

**Response:**

- Lead Entity status requires that the County: (1) develop a county-wide habitat restoration project list, (2) establish a committee for citizen-based evaluation and prioritization of projects proposed to promote salmon restoration, and (3) help to identify funding sources for projects.

Some members of the EWPU Landowners Steering Committee also participate on the citizen-based committee that has been established for prioritization of all salmon recovery projects that are submitted to the Salmon Recovery Funding Board (SRFB) for consideration. Currently, only applications submitted to the SRFB require citizen committee review. EWPU LSC membership on the citizen’s committee is complimentary, not duplicative; it assures that local level restoration priorities for the Entiat are represented during the overall county-level project prioritization process.

- *Additional text noting the role of LSC members on the county citizen-committee has been added in the first paragraph on page 31 to clarify this nexus.*

**Comment:** (1)

Table 17 (Summary of ongoing monitoring activities). WDFW is currently monitoring project effectiveness at the Wilson side-channel project and the Jon Small off-channel enhancement (Lower Entiat).

**Response:**

- *Table 17 has been edited to include WDFW effectiveness monitoring activities.*

**Comment: (1)**

Page 5, Acronym for WDFW is incorrect - *Existing*: Washington Department of Ecology; *Change to*: Washington Department of Fish and Wildlife.

Page 29, First bullet for WDFW under Authority/Role - *Existing*: Provide technical assistance on and hydraulic permitting for habitat restoration projects; *Change to*: 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.

**Response:**

- *The text on page 5 and language regarding the role of the Washington Department of Fish and Wildlife has been modified in table 6 on page 29 to reflect the changes recommended.*

**Comment: (2)**

An implementation plan is suppose to complement (be an appendix) to the watershed plan. The DIP does not have to be a stand alone document I would recommend that you remove sections that have been taken out of the watershed plan...and incorporate by reference.

Pg. 7-9: Delete Section 3.0 Setting. It is already described in the watershed plan.

Pg. 9-18: Delete Section 4.0 Approach. It is already described in the watershed plan.

Pg. 18-26: Delete Section 5.0 WRIA Strategies and Actions. It is already described in the watershed plan.

Pg. 28: Table 6: RTT Delete the 2nd and 3rd bullet. These are not activities within the RTT purview.

Pg 31: Delete Completed Actions: It is already described in the watershed plan.

Pg 31-34: Delete Ongoing Actions: It is already described in the watershed plan as well as being located in the implementation schedule tables

Pg 53-57: Section 9.0: approvals, Permits and Administrative Tools. Isn't there a section in the watershed plan that describes this? If so delete this section.

Pg 58: Section 10.2 . Delete the last paragraph.

Pg 64: Table 17: Summer Chinook Redds Surveys have no dedicated annual funds

Delete Appendix A: It is already described in the watershed plan.

Delete Appendix B: It is already described in the watershed plan.

Delete Appendix C. Incorporate by reference

Leave in Appendix D

Delete Appendix F: It is already described in the watershed plan.

Leave in Appendix H.

Do a global change for NOAA-Fisheries to National Marine Fisheries Service or NMFS.

**Response:**

Thank you for your comments. The following changes have been made in response:

- *On page 29, language regarding the role of the Regional Technical Team has been modified in the table to reflect the changes recommended by Bob Bugert on behalf of the RTT. See the comment followed by the number four (4) for specific language.*
- *Section 9.0 - Approvals, Permits and Administrative Tools. Language in this section must remain in order to be compliance with DIP elements required by Chapter 90.82 RCW.*
- *Table 17 - the comments column on page 66 was edited to reflect that there is no dedicated annual funding for summer Chinook redd surveys.*
- *Throughout the document, all NOAA Fisheries references were changed to NMFS.*

**Comment:** (3)

In Table 6 (p 28), one of the agency/groups is RTT. The second bullet describes how RTT will "help secure funding for research, M&E." This was pointed out as not being a function of the RTT; [however,] the last bullet will be a task for the UCSRB's implementation team, which the RTT is part of.

**Response:**

- *Language in Table 6, p. 29, regarding the role of the Regional Technical Team has been modified in the table to reflect the changes recommended by Bob Bugert on behalf of the RTT. See the comment followed by the number four (4) for specific language.*

**Comment:** (3)

In table 18, page 70, under HCP tributary funds for Wells, Rock Island, and Rocky Reach. The Wells HCP funding is only available per the Agreement for projects above Wells dam. Grant PUD isn't part of the Wells, RI/RR HCP's (they have Priest/Wanapum), I do believe they have a similar habitat account but I don't think it's called a HCP.

**Response:**

Thank you for the clarification.

- *Table 18 on page 72 has been modified to indicate that only the Rock Island and Rocky Reach HCP Tributary Fund Accounts, administered through the Chelan County PUD, are available to fund Entiat projects. Text indicating a separate, non-HCP "habitat account" administered by Grant PUD has been added.*

**Comment:** (4)

In Table 6 (Authorities and roles of select EWPU entities, and sources of funding support), the Plan identifies the RTT to do the following:

1. Provide research and monitoring guidance and input to EWPU process.
2. Help secure funding for research, monitoring and evaluation activities in the Entiat subbasin.
3. Act as a link between local EWPU activities and larger regional and state R, M & E initiatives.
4. Facilitate local-to-regional level salmon recovery planning and fisheries management dialogue.

The RTT had a chance to discuss this and would like to offer you the following recommendations. Task numbers 1 and 3 are appropriate activities for the RTT, but it is not in our interest (or in our charter for that matter) to help secure funding or to facilitate local-to-regional planning (tasks 2 and 4). These activities will be more appropriately done by the Implementation Team to the UCSRB, once formed. The RTT will participate in that process, but the responsibility (at least in our minds), will rest with the Implementation Team.

For task 2, could you change it to "Provide technical assistance to those securing funding..." Likewise, for task 4, perhaps you can modify the language to read "provide technical assistance in local...) instead of "facilitate."

**Response:**

Thank you for submitting comments on behalf of the Upper Columbia Regional Technical Team (RTT).

- *The text in bullets two and four on Table 6 on page 29 has been updated with the language recommended in the last paragraph of the comment.*

**Comment: (5)**

Due to the few number of water systems in this WRIA, our concerns were pretty minimal except for the instream flow reserve. Our focus during development of this plan was that any community water uses (and increase in use) remain in the instream flow reserve. Since all of that is still intact, everything looks okay.

**Response:**

Thank you for your review of the Entiat DIP, particularly with respect to its compliance with required elements under Chapter 90.82 RCW. Significant effort was made to assure that all water quantity and instream flow related issues were addressed in the implementation plan.

**Comment: (6)**

I focused mainly on the near-term actions section because I think that this is where the planning unit should focus its time over the next couple of years to get some successes under its belt. I did not see the land trust mentioned and believe that they will be doing plantings and general maintenance on their lands over time. I don't know what plans they have for more acquisitions. For the County, our role will continue on the policy, funding, land use and implementation elements as you've indicated—Entiat projects that come to mind include finishing up the Bancroft conservation easement, developing ag lease and TDR programs, working with Harrison on B2B, critical areas update, instream structure permitting and implementation, and obtaining funding for projects where needed. As the planning unit focuses more and more on implementation, specific roles will be clarified and the document will likely need to be updated—maybe there are provisions for that in here already and I didn't get to it.

**Response:**

Thank your for your comments and support.

Section 7.1, Completed Actions, highlights some of the successful projects and initiatives that have already been completed by the EWPU; instream structure, off-channel and riparian revegetation projects with new landowners were all implemented by EWPU partners within the last year and a half. Other recent EWPU successes include instream flow codification and obtaining 4(b) water quality categorization for temperature from the state and EPA, thus alleviating regulatory need for a temperature TMDL.

Language regarding the County's role in land use planning, related policy items, and helping to secure funding is contained in Table 6, Authorities and Roles of Select EWPU Entities..., on page 28, as well as in Section 6.2, Eliminating Duplication.

Regarding omission of some EWPU partner roles:

- *Table 6, Authorities and Roles of Select EWPU Entities..., on page 30 has been edited to include Chelan-Douglas Land Trust activities.*
- *Section 7.2, Ongoing Actions, beginning on page 32 has been edited to include an item related to land use management and policy covering your comments regarding the County work that is currently underway, e.g. finishing the Bancroft conservation easement, developing pilot lease and transfer of development rights (TDR) programs, working with land management agencies to facilitate implementation of projects with a land-use policy element, and coordination of County Critical Areas Ordinance updates with the EWPU.*
- *Section 7.2 on page 33 now includes a riparian/upland restoration item to cover Chelan-Douglas Land Trust replanting on lands they manage, and revegetation efforts by other entities. Reference to ongoing federal upland fuels reduction and community wildfire planning initiatives has also been added.*



- *Table 7 on page 36 has been edited to include the new ongoing actions items addressed in text on pages 32-33.*

Regarding the County's role in instream structure permitting and implementation, Table 7, early implementation actions... lists the County as a Support Entity for Phase 1 to indicate the funding that the County is currently providing for contracted permitting related to Phases I, II and III of the Bridge-to-Bridge project

- *Table 7 has been edited to include "Chelan Co?" in the Lead Entity column related to Bridge-to-Bridge Reach Restoration, Phases II and III construction, and Restoration below RM 6.8 - obtaining landowner agreements, preparing and submitting permits and ESA consultation documents, and construction.*

A question mark (?) was added, i.e. Chelan County?, because the County was recently awarded Salmon Recovery Funding Board (SRFB) funds for additional instream structure construction in the Entiat, and during EWPU discussion about whether it wished the County to pursue such funds, the County stated that either they or Conservation District could be the project sponsor were the grant application successful. Additional dialogue is needed between the County, District and the EWPU regarding: 1) who the project sponsor will be; 2) whether a portion of the SRFB funds should be used for instream construction anticipated as part of Phases II and III of the Bridge-to-Bridge project; and 3) the roles that County and Conservation District staff will play during implementation of additional near-term restoration activities in the Entiat.

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Entiat Detailed Implementation Plan commenters:

- (1) Washington Department of Fish and Wildlife
- (2) US Fish and Wildlife Service
- (3) Public Utility District No. 1 of Chelan County
- (4) Upper Columbia Regional Technical Team
- (5) Washington Department of Health
- (6) Chelan County Natural Resource Department