Chelan County
Grant No. G0800231

FINAL

SHORELINE RESTORATION PLAN for Shorelines in Chelan County and the Cities of Cashmere, Chelan, Entiat, Leavenworth and Wenatchee

Project: Comprehensive Shoreline Master Program Update

- **Task 10: Prepare a Restoration Plan**

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CHELAN COUNTY SHORELINE MASTER PROGRAM UPDATE
FINAL SHORELINE RESTORATION PLAN

1. INTRODUCTION

A jurisdiction's Shoreline Master Program applies to activities in the jurisdiction's shoreline[1] area. Activities that have adverse effects on the ecological functions and values of the shoreline must provide mitigation for those impacts. By law, the proponent of that activity is not required to return the subject shoreline to a condition that is better than the baseline level at the time the activity takes place. How then can the shoreline be improved over time in areas where the baseline condition is severely, or even marginally, degraded?

Section 173-26-201(2) (f) WAC of the Shoreline Master Program Guidelines[2] says:

> *"master programs shall include goals and policies that provide for restoration of such impaired ecological functions. These master program provisions shall identify existing policies and programs that contribute to planned restoration goals and identify any additional policies and programs that local government will implement to achieve its goals. These master program elements regarding restoration should make real and meaningful use of established or funded nonregulatory policies and programs that contribute to restoration of ecological functions, and should appropriately consider the direct or indirect effects of other regulatory or nonregulatory programs under other local, state, and federal laws, as well as any restoration effects that may flow indirectly from shoreline development regulations and mitigation standards."*

However, degraded shorelines are not just a result of pre-Shoreline Master Program activities, but also of unregulated activities and exempt development. The new Guidelines also require that "[l]ocal master programs shall include regulations ensuring that exempt development in the aggregate will not cause a net loss of ecological functions of the shoreline." While some actions within shoreline jurisdiction are exempt from a permit, the Shoreline Master Program should clearly state that those actions are not exempt from compliance with the

[1] "Shorelines" means all of the water areas of the state, including reservoirs, and their associated shorelands, together with the lands underlying them…" (RCW 90.58.030(2)(d))

[2] The Shoreline Master Program Guidelines were prepared by the Washington Department of Ecology and codified as WAC 173-26. The Guidelines translate the broad policies of the Shoreline Management Act (RCW 90.58.020) into standards for regulation of shoreline uses. See http://www.ecy.wa.gov/programs/sea/sma/guidelines/index.html for more background.

Shoreline Management Act or the local Shoreline Master Program. Because the shoreline environment is also affected by activities taking place outside of a specific local master program's jurisdiction (e.g., outside of county/city limits, outside of the shoreline area within the county/city), assembly of out-of-jurisdiction actions, programs and policies can be essential for understanding how the County and Cities fit into the larger watershed context. The latter is critical when establishing realistic goals and objectives for dynamic and highly inter-connected environments.

As directed by the Guidelines, the following discussions provide a summary of baseline shoreline conditions, list restoration goals and objectives, and discuss existing or potential programs and projects that positively impact the shoreline environment. Finally, anticipated scheduling, funding, and monitoring of these various comprehensive restoration elements are provided. In total, implementation of the Shoreline Master Program (with mitigation of project-related impacts) in combination with this Restoration Plan (for restoration of lost ecological functions) should result in a net improvement within Chelan County, and the Cities of Cashmere, Chelan, Entiat, Leavenworth and Wenatchee's shoreline environment in the long term.

In addition to meeting the requirements of the Guidelines, this Restoration Plan is also intended to support the County's, Cities' or other non-governmental organizations' applications for grant funding, and to provide the interested public with contact information for the various entities working within the County and Cities to enhance the environment.

2. SHORELINE INVENTORY SUMMARY

2.1 Introduction

An inventory was conducted for all County and City shorelines as defined by the state's Shoreline Management Act (SMA) (RCW 90.58). The inventory was conducted according to direction provided in the Guidelines (WAC 173-26-201) and in the Grant Agreement promulgated by Ecology. It referenced "relevant and reasonably available" information (WAC 173-26-201(3)(c)) from County, City, State and Federal agencies; utilities; private non-governmental organizations; and Advisory Committee members, among others. The *Shoreline Inventory and Analysis Report* (*Analysis Report*) (The Watershed Company and ICF Jones & Stokes 2009 [TWC and J&S]) utilizes the existing watershed and sub-basin plans to the maximum extent practicable given the Guidelines and the topical coverage of those management plans. Many parties were active participants to the Advisory Committee for the SMP Update; the remaining parties have been and will continue to be notified at key project stages and

provided with opportunities to submit relevant information. Collected information was supplemented with other resources such as scientific literature, personal communications, aerial photographs, and internet documents.

The *Analysis Report* (TWC and J&S 2009) will serve as the baseline from which the possible effects of potential development actions in the shoreline will be measured. Ideally, the SMP, in combination with other County, City and regional efforts, will ultimately produce a net improvement in shoreline ecological functions. The *Analysis Report* (TWC and J&S 2009) describes existing physical and biological conditions in the shoreline area within County and City limits, including recommendations for restoration of ecological functions where they are degraded. The full *Analysis Report* (TWC and J&S 2009) is summarized below.

2.2 Shoreline Boundaries

As defined by the Shoreline Management Act of 1971, shorelines include certain waters of the state plus their associated "shorelands." At a minimum, the waterbodies designated as shorelines of the state are streams whose mean annual flow is 20 cubic feet per second (cfs) or greater or lakes whose area is greater than 20 acres. In addition, shorelines of statewide significance are those streams and rivers that meet one or more of the following criteria

> *"i. that have either: a mean annual flow of 200 cubic feet per second or more, or;*
>
> *ii. the portion downstream from the first 300 square miles of drainage areas.*

Shorelands are defined as:

> *"those lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter…Any county or city may determine that portion of a one-hundred-year-floodplain to be included in its master program as long as such portion includes, as a minimum, the floodway and the adjacent land extending landward two hundred feet therefrom… Any city or county may also include in its master program land necessary for buffers for critical areas… (RCW 90.58.030)"*

The County and City shoreline boundaries have been updated (subject to Board of County Commissioners (BOCC), City Councils, and Ecology approval) concurrent with the *Analysis Report* (TWC and J&S 2009) through use of improved stream flow modeling by the United States Geological Survey and

improved lake area mapping that resulted in increased accuracy of jurisdiction identification and mapping. Past mapping errors by USGS and Ecology have been corrected so that federal lands are no longer excluded from shoreline jurisdiction.

2.2.1 Chelan County

Chelan County encompasses 2,294 square miles and is located in the north-central part of Washington. The county is bordered to the south by Kittitas County, to the southwest by King County, to the west by Snohomish County, to the northwest by Skagit County, to the northeast by Okanogan County, and to the east by Douglas County. Chelan County is predominantly rural in nature, with unincorporated areas making up most of the land area. Chelan County includes four Watershed Resource Inventory Areas (WRIAs) (WRIA 40a - Stemilt-Squilchuck and part of WRIA 40b located in Chelan County [Colockum Creek basin], WRIA 45 - Wenatchee, WRIA 46 - Entiat, and WRIA 47 – Chelan) and five incorporated cities (Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee).

The *Analysis Report* (TWC and J&S 2009) provided detail about 80 streams/rivers and 53 lakes that may meet shoreline jurisdiction criteria. The total acreage of upland shorelands (excluding area of the shoreline waterbodies) is approximately 42,693.

Federal lands make up 68 percent of that acreage, or 29,211 acres total. Of the 133 total shoreline waterbodies, 94 are entirely on federal lands and another 17 have more than 50 percent of their shoreland areas on federal land. The three federal entities that own the majority of the federal land are the United States Forest Service (USFS), the National Park Service (NPS), and the United States Bureau of Land Management (BLM). Four USFS wilderness areas are found along Chelan County shorelines: Lake Chelan Sawtooth Wilderness, Glacier Peak Wilderness, Henry M. Jackson Wilderness, and Alpine Lakes Wilderness. These areas have the greatest level of protection and stringent prohibitions on alteration. A large area at the north end of Lake Chelan is also part of NPS's Lake Chelan National Recreation Area.

Tables 1 and 2 of the *Analysis Report* (TWC and J&S 2009) present the list of shoreline jurisdictional waterbodies, and some basic jurisdictional history. These tables have been included in this document as Tables 1 and 2 below.

Table 1. Shoreline Jurisdiction Streams and Rivers

River/Creek Name	Mapped as Shoreline Under Existing SMP	Total Length of Proposed Shoreline (ft)	River/Creek Name	Mapped as Shoreline Under Existing SMP	Total Length of Proposed Shoreline (ft)
Agnes Creek	No	29,474	Mill Creek	No	6,781
Basin Creek	No	1,770	Mission Creek	Yes	39,870
Big Meadow Creek	No	5,541	Mountaineer Creek	No	15,747
Boulder Creek 1	No	20,203	Napeequa River	Yes	88,773
Boulder Creek 2	No	4,702	Nason Creek*	Yes	122,246
Bridge Creek	No	62,307	North Fork Bridge Creek	No	33,667
Buck Creek	No	19,291	North Fork Entiat River	No	34,972
Cady Creek	No	15,527	North Fork Thirtyfive Mile Creek	No	3,104
Chelan River*	Yes	21,818	Panther Creek	No	22,409
Chikamin Creek	Yes	14,641	Park Creek	No	28,140
Chiwaukum Creek	No	41,892	Peshastin Creek	Yes	64,582
Chiwawa River*	Yes	200,777	Phelps Creek	Yes	31,266
Chumstick Creek	No	24,601	Pole Creek	No	249
Colockum Creek	No	19,380	Prince Creek	No	27,914
Columbia River*	Yes	395,252	Prospect Creek	No	7,479
Company Creek	No	47,709	Railroad Creek	Yes	78,823
Cottonwood Creek	No	2,617	Rainbow Creek	No	21,952
Cougar Creek	No	41	Rainy Creek	No	25,678
Doubtful Creek	No	59	Rimrock Creek	No	2,849
Eightmile Creek	Yes	21,678	Roaring Creek	No	75
Entiat River*	Yes	269,902	Rock Creek	No	29,154
Fish Creek	No	20,158	Snowall Creek	No	11,418
Fish Creek	No	17,825	South Fork Agnes Creek	No	48,380
Flat Creek	No	41,871	South Fork Bridge Creek	No	12,953
French Creek	No	38,892	South Fork Chiwaukum Creek	Yes	16,709
Ibex Creek	No	3,443	South Fork Flat Creek	No	4,702
Ice Creek	No	6,088	Spruce Creek	No	16,427
Icicle Creek*	Yes	151,122	Stehekin River*	Yes	125,759
Indian Creek	No	35,568	Swamp Creek	No	5,190
Ingalls Creek	Yes	56,766	Thunder Creek	No	12,715
Jack Creek	No	45,045	Tommy Creek	No	7,255
Lake Creek	No	8,846	Trapper Creek	No	7,437
Lake Creek	No	21,104	Trout Creek	No	9,324
Leland Creek	No	24,814	Twentyfive Mile Creek	Yes	15,544
Lightning Creek	No	4,059	Wenatchee River*	Yes	278,629
Little Wenatchee River*	Yes	117,784	West Fork Agnes Creek	No	34,890

River/Creek Name	Mapped as Shoreline Under Existing SMP	Total Length of Proposed Shoreline (ft)	River/Creek Name	Mapped as Shoreline Under Existing SMP	Total Length of Proposed Shoreline (ft)
Mad River	Yes	104,360	West Fork Flat Creek	No	10,583
Maple Creek	No	10,153	White River*	Yes	153,763
McAlester Creek	No	12,397	Whitepine Creek	Yes	31,390
Meadow Creek	No	9,909	Wildhorse Creek	No	13,921
					TOTAL: 3,452,102 ft (653.8 miles)

* Streams/rivers that are partial or complete Shorelines of Statewide Significance.

Table 2. Shoreline Jurisdiction Lakes

Lake Name	Mapped as Shoreline Under Existing SMP	Total Area of Proposed Shoreline Lake (acres)	Lake Name	Mapped as Shoreline Under Existing SMP	Total Area of Proposed Shoreline Lake (acres)
Antilon Lake	Yes	35	Lichtenwasser Lake	No	26
Black Lake (aka Wheeler Hill or Spring Hill Reservoir)	Yes	33	Loch Eileen Lake	Yes	26
Chiwaukum Lake	Yes	70	Lost Lake	No	27
Colchuck Lake	Yes	88	Lyman Lake	No	74
Cortez Lake	Yes	34	Meadow Lake	Yes	36
Cub Lake	No	23	Mirror Lake	No	25
Domke Lake	No	273	Nada Lake	No	23
Doubtful Lake	No	30	Perfection Lake	No	21
Dry Lake	Yes	81	Rainy Lake	No	53
Eightmile Lake	Yes	65	Roses Lake	Yes	178
Fish Lake	Yes	503	Schaefer Lake	No	83
Glasses Lake	No	23	Shield Lake	No	39
Green View Lake	No	41	Snow Lake-Lower	Yes	65
Hart Lake	No	33	Snow Lake-Upper	Yes	126
Heather Lake	No	86	Square Lake	No	73
Ice Lakes (1)	No	44	Stemilt Project Reservoir	No	22
Ice Lakes (2)	No	20	Stuart Lake	No	41
Josephine Lake	No	24	Surprise Lake	No	40
Klonaqua Lakes (1) Lower	Yes	66	Theseus Lake	No	29
Klonaqua Lakes (2) Upper	Yes	65	Trapper Lake	No	148
Lake Augusta	No	24	Twin Lakes (1)	No	33

Lake Name	Mapped as Shoreline Under Existing SMP	Total Area of Proposed Shoreline Lake (acres)	Lake Name	Mapped as Shoreline Under Existing SMP	Total Area of Proposed Shoreline Lake (acres)
Lake Chelan*	Yes	32,623	Twin Lakes (2)	No	259
Lake Leland	No	36	Unnamed Lake 1	No	34
Lake Valhalla	No	25	Upper Wheeler Reservoir	Yes	34
Lake Victoria	Yes	26	Wapato Lake	Yes	195
Lake Wenatchee*	Yes	2,449	White Rock Lakes (1)	No	20
Larch Lake	No	30			
					TOTAL: 38,577 acres

* Lakes that are partial or complete Shorelines of Statewide Significance.

2.2.2 Stemilt/Squilchuck-Colockum (WRIA 40a/b)

The Stemilt/Squilchuck - Colockum watershed (WRIA 40a/b) is approximately 49,000 acres, and includes two shoreline streams/rivers and five lakes. The area of upland shoreline jurisdiction totals 739 acres along 137,001 linear feet (26 miles) of shoreline. Table 3 provides the name of each shoreline waterbody in WRIA 40a/b.

Table 3. Shoreline waterbodies in WRIA 40a/b, outside of cities and their urban growth areas.

Jurisdictional Streams/Lakes			
Colockum Creek	Black Lake	Meadow Lake	Upper Wheeler Reservoir
Columbia River	Cortez Lake	Stemilt Project Reservoir	

2.2.3 Wenatchee (WRIA 45)

The Wenatchee watershed (WRIA 45) is approximately 1,370 square miles, and contains 45 shoreline streams/rivers and 29 shoreline lakes. The area of upland shoreline jurisdiction totals 24,652 acres along 2,159,741 linear feet (409 miles) of shoreline. The headwaters of WRIA 45 originate in the Cascade Mountain range as the Little Wenatchee and White Rivers. These rivers flow into Lake Wenatchee, the source of the Wenatchee River. Table 4 provides the name of each shoreline waterbody in WRIA 45.

Table 4. Shoreline waterbodies in WRIA 45, outside of cities and their urban growth areas.

Jurisdictional Streams/Lakes				
Big Meadow Creek	Icicle Creek	Peshastin Creek	Wildhorse Creek	Loch Eileen Lake
Boulder Creek	Indian Creek	Phelps Creek	Chiwaukum Lake	Lost Lake
Buck Creek	Ingalls Creek	Pole Creek	Colchuck Lake	Nada Lake
Cady Creek	Jack Creek	Prospect Creek	Eightmile Lake	Perfection Lake
Chikamin Creek	Lake Creek	Rainy Creek	Fish Lake	Schaefer Lake
Chiwaukum Creek	Leland Creek	Roaring Creek	Glasses Lake	Shield Lake
Chiwaukum Creek SF	Lightning Creek	Rock Creek	Heather Lake	Snow Lake Lower
Chiwawa River	Little Wenatchee River	SF Chiwaukum Creek	Josephine Lake	Snow Lake Upper
Chumstick Creek	Meadow Creek	Snowall Creek	Klonaqua Lakes Lower	Square Lake
Columbia River	Mill Creek	Thunder Creek	Klonaqua Lakes Upper	Stuart Lake
Cougar Creek	Mission Creek	Trapper Creek	Lake Augusta	Theseus Lake
Eightmile Creek	Mountaineer Creek	Trout Creek	Lake Leland	Twin Lakes 1
Fish Creek	Napeequa River	Wenatchee River	Lake Valhalla	Twin Lakes 2
French Creek	Nason Creek	White River	Lake Victoria	
Ibex Creek	Panther Creek	Whitepine Creek	Lake Wenatchee	

2.2.4 Entiat (WRIA 46)

WRIA 46 contains 305,641 acres, including 5,065 acres of shorelands and 526,093 linear feet (100 miles) of shoreline along seven streams/rivers and two lakes. Table 5 provides the name of each shoreline waterbody in WRIA 46.

Table 5. Shoreline waterbodies in WRIA 46, outside of cities and their urban growth areas.

Jurisdictional Streams/Lakes		
Columbia River	Lake Creek	Tommy Creek
Entiat River	Mad River	Ice Lake 1
Ice Creek	NF Entiat River	Ice Lake 2

2.2.5 Chelan (WRIA 47)

Chelan watershed (WRIA 47) as a whole contains 670,080 acres, including 11,160 acres of shorelands along 1,596,517 linear feet (302 miles) of shoreline, distributed

among 30 shoreline streams/rivers and 17 shoreline lakes. Table 6 provides the name of each shoreline waterbody in WRIA 47.

Table 6. Shoreline waterbodies in WRIA 47, outside of cities and their urban growth areas.

Jurisdictional Streams/Lakes				
Agnes Creek	Flat Creek	SF Agnes Creek	Antilon Lake	Rainy Lake
Basin Creek	Maple Creek	SF Bridge Creek	Cub Lake	Roses Lake
Boulder Creek 1	McAlester Creek	SF Flat Creek	Domke Lake	Surprise Lake
Bridge Creek	NF Bridge Creek	Spruce Creek	Doubtful Lake	Trapper Lake
Chelan River	NF Thirtyfive Mile Creek	Stehekin River	Dry Lake	Unnamed Lake 1
Columbia River	Park Creek	Swamp Creek	Green View Lake	Wapato Lake
Company Creek	Prince Creek	Twentyfive Mile Creek	Hart Lake	White Rock Lake 1
Cottonwood Creek	Railroad Creek	WF Agnes Creek	Lake Chelan	
Doubtful Creek	Rainbow Creek	WF Flat Creek	Lyman Lake	
Fish Creek 1	Rimrock Creek	WF Agnes Creek	Mirror Lake	

2.2.6 City of Cashmere

Shorelands in the City of Cashmere include areas within 200 feet of the ordinary high water mark, floodways, portions of their adjacent floodplains, and any associated wetlands within those floodplains. Waters identified within jurisdiction include Mission Creek and the Wenatchee River. The shoreline acres in the City and UGA equal 238, and the shoreline length equals 12,159 feet.

2.2.7 City of Chelan

Shorelands in the City of Chelan include only areas within 200 feet of the ordinary high water mark, floodways, portions of their adjacent floodplains, and any associated wetlands within those floodplains. Waters identified within jurisdiction include Lake Chelan, the Chelan River and a very small portion of the Columbia River. Together the City and its UGA have 517 acres and 109,558 linear feet in shoreline jurisdiction.

2.2.8 City of Entiat

Shorelands in the City of Entiat include only areas within 200 feet of the ordinary high water mark, floodways, portions of their adjacent floodplains and any associated wetlands within those floodplains. Waters identified within jurisdiction include the Entiat and Columbia Rivers. The City of Entiat contains 117 acres and 22,500 linear feet in shoreline jurisdiction.

2.2.9 City of Leavenworth

Shorelands in the City of Entiat include only areas within 200 feet of the ordinary high water mark, floodways, portions of their adjacent floodplains and any associated wetlands within those floodplains. Waters identified within jurisdiction include Chumstick Creek and the Wenatchee River. The City of Leavenworth and its UGA contain a total shoreland area of approximately 148 acres and runs 5,071 linear feet.

2.2.10 City of Wenatchee

Shorelands in the City of Wenatchee include only areas within 200 feet of the ordinary high water mark, floodways, portions of their adjacent floodplains and any associated wetlands within those floodplains. Waters identified within jurisdiction include the Wenatchee and Columbia Rivers. In the City and its UGA, shoreline jurisdiction contains 282 acres and 51,484 linear feet.

2.3 Inventory and Analysis Summary

The *Shoreline Inventory and Analysis Report* (TWC and J&S 2009) is divided into seven main sections: Introduction, Current Regulatory Framework Summary, Elements of the Shoreline Inventory, Shoreline-Specific Conditions, Analysis of Ecological Functions and Ecosystem-wide Processes, Land Use Analysis, and Public Access Analysis. Most of these chapters were subdivided into sections for the County and watershed. Discussions were broken into the four WRIAs (WRIA 40a - Stemilt-Squilchuck and part of WRIA 40b located in Chelan County [Colockum Creek basin], WRIA 45 - Wenatchee, WRIA 46 - Entiat, and WRIA 47 – Chelan) and five Cities (Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee). The WRIA discussions do not include information for the incorporated Cities and their UGAs. The City discussions include each City's UGA. The following inventory is summarized from detailed information presented in the *Analysis Report* (TWC and J&S 2009).

2.3.1 Chelan County

Land Use and Physical Conditions

Most human settlements (both pre-historic and historic) in Chelan County have developed along waterbodies. The communities that developed are likewise connected along waterbodies by transportation and utility corridors. County-wide water-oriented uses include: agriculture, fish hatcheries, certain hotels/motels, marine craft transportation, open space, parks, recreational activities, resorts and group camps, and retail trade-eating/drinking.

In the unincorporated WRIAs, the current land use patterns are predominantly rural residential, government/utility, and forestry and agriculture resource lands,

with exceptions – such as small towns along rivers and streams, lake communities, and some focused areas of rural industrial and rural waterfront commercial. Relatively more urban and intensive development is found in the cities, particularly Chelan (commercial, tourist, recreation), Cashmere (mixed use), and Wenatchee (utility and industrial). Some cities have extensive open space along their shorelines, such as Entiat, Leavenworth and Wenatchee, due to municipal, Public Utility District (PUD), County, or state park lands.

Future land use designations tend to reinforce current land use patterns, but there are areas of the County that are identified for new or greater uses. Unincorporated shorelines that are in public ownership tend to be identified for resource uses, while those in private ownership tend to be planned for rural residential, rural commercial/waterfront, or rural industrial uses. City shorelines are planned for a wider variety of activities to support their role as centers of the local community. Many areas in the cities that are already developed are likely to see re-development. Entiat and Wenatchee have the most ambitious of these re-development/waterfront plans. All of the WRIAs are likely to see additional rural residential growth.

Biological Resources and Critical Areas

Numerous wetlands are associated with Chelan County shorelines, including emergent and palustrine wetlands. In Chelan County, emergent wetlands are most likely to be sedge meadows and montane meadows, and palustrine wetlands would be dominated by woody vegetation occurring along watercourses. Old-growth forest corridors are found throughout the county, having been mapped by the USFS as part of its *Northwest Forest Plan*.

Chelan County has many critical areas discussed in more detail in the sections below.

2.3.2 Stemilt/Squilchuck–Colockum (WRIA 40a/b)

Land Use and Physical Conditions

WRIA 40a/b is dominated by resource lands, including commercial agriculture and commercial forestry. Residential and industrial uses tend to congregate closer to the Columbia River and other waterbodies in the eastern portion of the WRIA (RH2 Engineering, Inc. 2007). Geologically hazardous areas are common, particularly around the three reservoirs (which are considered to have 100% geohazard coverage). Shorelands within WRIA 40a/b are currently used for: agriculture; cultural/recreation/assembly; forestry; government/utility; manufacturing/industry; natural resources; residential; and transportation.

Twenty-seven percent (27%) of the WRIA remains undeveloped, although plans for additional single-family rural residential dwellings (23% of the current land

use, planned to increase to 65% of the shoreland area) would reduce the amount of undeveloped land in time. Likewise, increases in rural industrial shoreline use, accounting for 3% of the existing shoreline use, would increase to 22 percent. Current open space in shoreline jurisdiction totals about 166 acres, mostly along the Columbia River.

Biological Resources and Critical Areas

Shorelines contain a combined total of 569 acres of priority habitats and habitat features, including wetlands, riparian zones, cliffs/bluffs, elk and mule deer habitat, and wood duck breeding areas. WRIA 40a/b waters contain priority fish species as well. According to the National Wetlands Inventory (NWI) and hydric soils information, as much as 17% of the total shoreline area may be wetlands.

2.3.3 Wenatchee (WRIA 45)

Land Use and Physical Conditions

Government/utility uses and resource lands (forestry, agriculture, and other natural resources) dominate the majority of the 75 shorelines. Shorelands within WRIA 45 are currently used for: agriculture, commercial, cultural/recreation/assembly, forestry, government/utility, manufacturing/industry, natural resources, residential, transportation, and open space. WRIA 45 contains unincorporated and incorporated lands.

Water-oriented uses along shorelines in WRIA 45 include agriculture, parks/recreation/recreational activities, resorts and group camps, certain hotel/motels, eating and drinking places, and others. Much of the shorelines tend to be parcels without buildings, largely due to the commercial forest lands in the watershed. Most of the shoreline land is being used for government/utility is expected to remain, even where there are vacant parcels. With future development, the shorelines are likely to see added rural residential, which makes up 17 percent of the current land use, but is planned for over 24 percent of the shoreline lands.

Parks and open space are found along numerous shorelines in WRIA 45. Open space is estimated at approximately 24,699 acres, and park lands total about 17 acres (found along the Columbia and Wenatchee Rivers). Developed public access points include: trails, campgrounds, picnic areas, fishing easements, and boat launches. The trails are extensive, linking various waterbodies as well as running alongside waterbodies. Fishing easements and boat launches are located along the Wenatchee River.

Biological Resources and Critical Areas

Shorelines in WRIA 45 contain a combined total of 19,433 acres of priority habitats and habitat features. The most common habitats, in order of frequency

of occurrence, are those for elk calving, migration, concentrations, or foraging and mountain goat breeding or concentrations. Twenty-seven separate osprey nest sites are mapped in shoreline jurisdiction, distributed on five waterbodies. Many of the rivers, streams and lakes also contain priority fish species. According to the NWI and hydric soils information, as much as 39 percent of the total shoreline area may be wetlands. Floodplains and a few geohazard areas are also documented in the WRIA.

2.3.4 Entiat (WRIA 46)

Land Use and Physical Conditions

Current land uses in WRIA 46 shorelines are dominated by orchards, livestock production and grazing, timber harvest, residential housing, and recreation. The USFS and timber lands dominate in terms of acres (Chelan County Conservation District [CCCD] 2004). Non-federal shoreline uses include: agriculture, commercial, cultural/recreation/assembly, forestry, government/utility, natural resources, residential, and undeveloped land.

Water-oriented land use is primarily agriculture (at approximately 170 acres), with most of the acreage on the Entiat River, followed by the Columbia River. Other water-oriented uses include open space (non-commercial forest) and recreational activities. The majority of shorelines contain parcels without buildings. Most of the undeveloped land in the watershed is planned for commercial forestry, rural residential, and rural waterfront uses. Forestry uses likely would not result in permanent shoreline development, and residential lands are likely to continue in similar patterns as today, with some infill on vacant parcels. Rural waterfront uses include residential, and water related/water dependant recreational and tourist development.

Public access consists of view corridors, open space and parks. View corridors are prominent along the Columbia and Entiat Rivers (from higher elevations). Open space is estimated at approximately 3,084 acres with park land totaling about 1 acre (along the Entiat River). Developed public access points include trails and campgrounds in shoreline jurisdiction. Three of 10 shorelines have campground facilities and one shoreline has several trailheads. The trails are extensive, linking various waterbodies as well as running alongside waterbodies.

Biological Resources and Critical Areas

Shorelines in WRIA 46 contain a combined total of 5,504 acres of priority habitats and habitat features. The most common priority habitats, in order of frequency of occurrence, are those for lynx, followed by old-growth/mature forests and priority riparian zones. Many of the rivers, streams and lakes also contain priority fish species. According to the NWI and hydric soils information, as

much as 24 percent of the total shoreline area may be wetlands. Floodplains and a few geohazard areas are also documented in the WRIA.

2.3.5 Chelan (WRIA 47)

Land Use and Physical Conditions

Approximately 87 percent of WRIA 47 is in federal, state, and local government ownership. The remaining 13 percent is in private ownership. Current land uses in the WRIA as a whole include conservation, recreation, primary and secondary (vacation and second homes) residential, resorts, and agriculture. The upper two-thirds of the watershed can be accessed only by water, foot, horseback or air (floatplane) (Berg 2004). The shoreline land uses include: agriculture, commercial, cultural/recreation/assembly, forestry, government/utility, natural resources, residential, and undeveloped land. The existing land uses vary by individual waterbody, with some shorelines dominated by residential uses (Lake Chelan, Roses Lake, Wapato Lake), commercial uses (Chelan River, Twentyfive Mile Creek), and undeveloped lands (Fish Creek, Dry Lake).

WRIA 47 shorelines contain unincorporated and incorporated lands. Unincorporated lands are primarily used as commercial forest (71%) or residential (20%) lands. Shorelines planned for focused rural development (including rural waterfront development) include Twentyfive Mile Creek, Roses Lake, and Wapato Lake.

Parks and open space are found along numerous shorelines in the unincorporated area. Open space is estimated at approximately 9,417 acres, and park lands total less than 1 acre along Lake Chelan. Developed public access points include: trails, campgrounds, and boat launches. The trails are more extensive in the northern and western portion of the WRIA and alongside and between waterbodies. Most trails near Lake Chelan do not parallel the water, and radiate to other destinations away from the lake. Boat launches are numerous along Lake Chelan. View corridors are prominent along Lake Chelan in the vicinity of the City of Chelan. Lake Chelan is the most developed shoreline in WRIA 47, with boating and camping facilities. There are fewer facilities on a handful of other waterbodies.

Biological Resources and Critical Areas

Shorelines in WRIA 47 contain a combined total of 7,858 acres of priority habitats and habitat features. The most common priority habitats, in order of frequency of occurrence, are those for lynx (found in 28 shorelines), followed by mule deer breeding areas, concentrations, and migratory corridors. Many of the rivers, streams and lakes also contain priority fish species. According to the NWI and hydric soils information, as much as 16 percent of the total shoreline area may be

wetlands. Floodplains and a few geohazard areas are also documented in the WRIA.

2.3.6 City of Cashmere

Cashmere is a historic community in the lower Wenatchee River valley known for its agricultural-oriented industries, traditional downtown, and residential character.

Land Use and Physical Conditions

Mission Creek is largely flanked by single-family residential, but also commercial and government uses. The Wenatchee River is fronted mostly by government/utility uses, such as the City's wastewater treatment plant, Riverside Park, City sanitation and recycling facility, and a City mulching facility. Planned land uses are likewise a mix, maintaining the existing pattern of the majority of land for single family on Mission Creek and public for the Wenatchee River. Potential water-oriented uses include agricultural uses, and uses at public parks and open space along both Mission Creek and the Wenatchee River.

There are parcels which do not contain buildings on both Mission Creek (4% of land in the shoreline jurisdiction) and the Wenatchee River (29% of land in the shoreline jurisdiction). The City's two shorelines are mostly committed to urban development today, primarily single-family residential. However, some of the land along the Wenatchee River in the City limits contains older industrial structures or improvements that may redevelop. There may be additional growth on shorelines in the UGA, since this area has not yet fully developed. The City may see additional commercial or industrial uses along Mission Creek, which currently has 9 percent of the land being used for commercial purposes (but 15% of the land is planned for mixed commercial/light industrial and 10% in warehouse industrial).

Public access features include parks and open space along Mission Creek (having approximately 3 acres of parks and 1 acre of open space, equaling 7% of shoreline jurisdiction) and the Wenatchee River (with approximately 36 acres of open space at 33% of shoreline jurisdiction and over 32 acres in parks, equaling 29% of shoreline jurisdiction). Other public access features include a river access ramp easement along the Wenatchee River within Riverside Park, as well as visual access corridors from lands east and west of the Wenatchee River in the vicinity of US 2, Riverside Park, and higher elevations. Shoreline trails are present along both Mission Creek (602 feet in length) and the Wenatchee River (14,522 feet in length).

Biological Resources and Critical Areas

Shorelines in the City of Cashmere and its UGA contain a combined total of 46 acres of priority habitats and habitat features. Both the Wenatchee River and Mission Creek contain priority fish species. According to the NWI and hydric soils information, as much as 24 percent of the total shoreline area may be wetlands.

The critical area most prevalent on the City's Wenatchee River shoreline is "frequently flooded areas." Most of the City is protected by a City-owned, Corps-certified/built levee on the Wenatchee River. However, there is a gap in the Wenatchee River levee along Riverfront Drive, south of the Cotlets Way bridge. The area near Riverfront Drive is susceptible to flooding during heavy rains or high elevation snow melt.

2.3.7 City of Chelan

The City of Chelan is found along the eastern shore of Lake Chelan. The Chelan community attracts tourists and seasonal residents due to its historic charm, provision of commercial services, and recreational opportunities along Lake Chelan.

Land Use and Physical Conditions

Current land uses along the entire City and UGA shorelines are dominated by residential, commercial, recreation, government, but also include: agriculture, commercial, cultural/recreation/assembly, natural resources, residential, and undeveloped land. Most of the shoreline is developed apart from parklands. Plans for development or redevelopment along Lake Chelan and other public open space will be oriented to tourist, commercial, recreational services, activities, and residential uses (Land Use Element Commercial Policy 18). The City encourages efficient public use of shoreline properties (Land Use Element Urban Growth Area Policy 4), and will allow public and private development for adequate camping, boat launching, docking and moorage facilities, marinas, and other water-related recreational opportunities on Lake Chelan and the Columbia River (Economic Development Element Open Space and Recreation Policy 3).

Land uses have been proposed for all the City's shorelines, and may include: high density commercial, highway service commercial, waterfront commercial, public lands and facilities, single-family residential, multi-family residential, special use district, tourist accommodations, and warehousing and industrial land uses. Potential growth could occur on properties that are vacant or that do not have structures, as well as on lands the City has identified for further development in its plans.

Lake Chelan shorelines contain some water-oriented uses including parks (about 18 acres), agriculture (about than 2 acres), recreational activities (about 2 acres), resorts and group camps (about 8 acres), marine craft transportation (more than 1 acre), and eating/drinking places (more than 1 acre). The Chelan River has about 7 acres in shoreline jurisdiction for park use. Waterfront commercial and tourist accommodation are also water-oriented land uses found throughout City shorelines.

Public access consists of view corridors, open space and parks. View corridors are prevalent along roadways paralleling the water, and from higher elevations above the lake. Open space acres in the shoreline jurisdiction total about 47 acres, along the Chelan River (~ 17 acres) and along Lake Chelan (~ 30 acres). Based on the shoreline inventory, there are 17 recreation facilities on Lake Chelan within the City and UGA consisting of boat launches (2), boating facilities (2), community dock/marina (5), and other marinas (3).

Biological Resources and Critical Areas

Shorelines in the City of Chelan and its UGA contain less than 0.1 acre of priority habitat, limited to mule deer habitat in the small area of Columbia River shoreline. All of the City's shorelines contain priority fish species. According to the NWI and hydric soils information, as much as 11 percent of the total shoreline area may be wetlands. Most of these potential wetlands are located in the Chelan River shorelands. The portions of the Chelan River and Columbia River in the City and UGA contain substantial areas identified as geologic hazards.

2.3.8 City of Entiat

The City of Entiat serves as a central gathering point for a broader community surrounding the City limits.

Land Use and Physical Conditions

Primarily land is used for government/utility and residential purposes, but also as open space. Along both the Columbia and Entiat Rivers, future land use plans call for a wider mix of uses, including commercial and business. Existing water-oriented uses in the City limits include a large park with shoreline recreation facilities.

There are a number of lots without structures (not necessarily without uses) along the Columbia (15 parcels, encompassing 71% of shoreline acres) and Entiat Rivers (7 parcels, encompassing 68% of shoreline acres). The Entiat Waterfront Master Plan (ESA Adolfson 2009) intends to facilitate tourism, commercial uses and economic development for the community along approximately 18 acres of Columbia River shoreland. Conceptual plans (dated December 2009) identify

potential uses for the shorelands including: a marina, mixed-use condominiums and retail, a hotel, a restaurant row, an amphitheatre, waterfront parks, picnic areas, riparian restoration, a fishing dock, multi-use trail, sidewalks, a new waterfront road and short side roads, and parking.

The Columbia River is lined with a park (Entiat City Park) and PUD-owned open space estimated at about 46 acres (54% of the shoreline). The remaining space is residential, City wastewater treatment facility, and a gravel mine. Open space land along the Entiat River is estimated at about 15 acres (47% of the shoreline). Shoreline viewing access is available for the Columbia and Entiat Rivers along roadways, and from hilltops or immediately along the shoreline. Physical access is primarily found at the Entiat City Park, providing over 4,000 feet of shoreline. The facilities at this park include 3 restrooms, 2 showers, 25 tent camping sites, 31 RV camping sites, and a boat launch. At this location, park users can boat, water ski, jet ski, swim and picnic. Additionally, a local museum is also located adjacent to the site. The Chelan County PUD is planning improvements to the park that may include additional boat launching facilities.

Biological Resources and Critical Areas

Shorelines in the City of Entiat and in the Columbia River fronting the City contain 130 acres of priority habitats, including bald eagle, riparian zones, mule deer, and waterfowl concentration areas. All of the City's shorelines contain priority fish species. According to the NWI and hydric soils information, as much as 16 percent of the total shoreline area may be wetlands. All of the potential wetlands identified by NWI are located along the Entiat River.

2.3.9 City of Leavenworth

Leavenworth is located in the upper reaches of the Wenatchee River Valley. Leavenworth is known for its Bavarian-themed downtown, as well as for its environmental quality along the Wenatchee River, where the City has obtained much of the shoreline for recreation or open space purposes.

Land Use and Physical Conditions

Along Leavenworth's combined shoreline area (including the UGA), the current land uses are dominated by government/utility, residential, and commercial uses, but also include: cultural/recreation/assembly and undeveloped land. Along the Wenatchee River and Chumstick Creek, future land plans generally follow current patterns, though some additional development would occur consistent with the following categories: central and general commercial zones, light industrial zone, recreation public zone, recreation zone, residential multi-family zone, rl-12 zone, rl-6 zone, and a tourist commercial zone.

Extensive park and recreation uses along the Wenatchee River (in the City) total approximately 54 acres in shoreline jurisdiction. There are also hotels/motels (4 acres approx.), a wastewater treatment plant (about 2 acres), and eating and drinking venues (less than 1 acre). Water-oriented uses include a small agricultural property (0.10 acre) on Chumstick Creek.

There are several public and private parcels with no structures on them, which may be locations for future waterfront development. Four of 13 parcels on Chumstick Creek do not have buildings (representing 40% of the shoreland), and 73 of the 172 parcels on the Wenatchee River (representing 32% of the shoreland) do not contain buildings presently. Generally, extensive changes along the shoreline are not anticipated due to the public recreation ownership of the public golf course and parks along much of the shoreline and the remaining already developed condition.

Shoreline visual access along the Wenatchee River is possible from public parks and access points on both sides of the river. Improvements to shoreline visual access points have been outlined in the *Downtown Master Plan* (City of Leavenworth 2007). Approximately 65 acres of park land and open space lie within the City's shoreline jurisdiction, with most located on the Wenatchee River. Four City-owned parks and recreation facilities (along the Wenatchee River) provide physical and visual shoreline access.

Biological Resources and Critical Areas

Shorelines in the City of Leavenworth and its UGA contain 115 acres of priority habitats, consisting only of priority riparian zones concentrations. All of the City's shorelines contain priority fish species. According to the NWI and hydric soils information, as much as 26 percent of the total shoreline area may be wetlands. No information was available regarding presence of geologically hazardous areas in the City of Leavenworth shorelines.

2.3.10 City of Wenatchee

The City of Wenatchee and its UGA are located along the banks of the Columbia River at the confluence of the Wenatchee River. Wenatchee is the largest city in Chelan County and is the primary center for jobs.

Land Use and Physical Conditions

Along the two shorelines in the City of Wenatchee, current land uses are dominated by government/utility and open space, but also include: agriculture, commercial, manufacturing/industrial, residential, transportation, and undeveloped land. Water-oriented uses include parks/open space (approximately 80 acres) and agriculture (6 acres), with 50 combined acres on the Columbia River and 30 combined acres on the Wenatchee.

Planned development along the City's shorelines may include: industry, the north Wenatchee business district, residential high/moderate/single-family, and waterfront mixed use. These planned land uses along the Columbia River shoreline may include industrial, high density residential, and parks. Planned land uses along the Wenatchee River may include single-family residential, industrial, and parks.

The Columbia River waterfront is flanked by public properties such as PUD recreation facilities and the railroad. The Sunnyslope area along the Wenatchee and Columbia Rivers is generally developed with homes and industrial uses, and is unlikely to see a significant change in the land use pattern (B. Frampton, personal communication, April 2008). There are several public and private parcels with no structures on them. Future development could occur on vacant parcels and on parcels subject to the *Wenatchee Waterfront Sub-Area Plan* (2003) which promotes redevelopment. Seventy-seven of 125 parcels on the Columbia River do not have buildings (representing 66% of the shoreland), and 20 of the 31 parcels on the Wenatchee River (representing 94% of the shoreland) do not contain buildings.

Open space and park land within the City's shoreline jurisdiction (totaling ~120 acres), may offer water access via boat launches, piers, or trails at some locations. Four waterfront parks and trails are present in the City and UGA. Planned parks and recreation improvement in or near the shoreline include waterfront moorage and parking, waterfront trail upland access and boathouse, and open space acquisition in the City of Wenatchee and its UGA at +/- 200 acres (City of Wenatchee 2008).

Biological Resources and Critical Areas

Shorelines in the City of Wenatchee and its UGA contain 253 acres of priority habitats, consisting of bald eagle, bighorn sheep, mule deer, and priority riparian zones concentrations. All of the City's shorelines contain priority fish species. According to the NWI and hydric soils information, as much as 38 percent of the total shoreline area may be wetlands. However, this figure is high because of the inclusion of some of the mainstem Columbia River as wetland. No information was available regarding presence of geologically hazardous areas in the City of Wenatchee.

3. RESTORATION GOALS AND OBJECTIVES

3.1 Chelan County

The following subsections discuss restoration goals and objectives previously identified in local WRIA, City and County planning efforts. Discussions are

broken into the four WRIAs and five Cities when applicable. The WRIA discussions do not include information for the incorporated Cities and their UGAs. The City discussions include each City's UGA.

3.1.1 County-Wide

Many of the watershed planning and salmon recovery efforts are administered by the Chelan County Natural Resources Department (CCNRD). Current activities include Wenatchee River Watershed (WRIA 45) planning and implementation, Squilchuck/Stemilt Watershed (WRIA 40a) planning and implementation, a County-wide salmon recovery grant program through Washington Salmon Recovery Funding Board, and habitat conservation plan development under the Federal Endangered Species Act (Chelan County website). CCNRD is also a partner with the Cascadia Conservation District (CCD) (formerly the Chelan County Conservation District) in the planning and implementation of the Entiat (WRIA 46) watershed plan, and the early planning stages of the Lake Chelan (WRIA 47) watershed plan. The goals and objectives of the above plans will be discussed in the appropriate WRIA subsections below.

The CCNRD also supports a regional salmon recovery effort, the Upper Columbia Salmon Recovery Board (UCSRB), and staffs the Chelan County Water Conservancy Board (Chelan County website).The mission statement of the UCSRB, whose planning area includes all of Chelan County except for the Chelan watershed, is:

> *"To restore viable and sustainable populations of salmon, steelhead, and other at risk species through collaborative, economically sensitive efforts, combined resources, and wise resource management of the Upper Columbia region."*

Restoration efforts throughout the County could focus on addressing the 12 factors for decline that were identified in the *Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan* (UCSRB 2007) for covered species. Areas for improvement may address the following factors:

- Social, Cultural, and Economic Factors
- Public Policy
- Management Actions
- Harvest
- Hatcheries
- Hydropower
- Habitat (includes alteration from land use practices, logging, mining, diversions, and other uses)
- Ecological Factors
- Factors Outside the ESU [Evolutionarily Significant Unit] and DPS [Distinct Population Segment]

- Interaction of Factors
- Current Threats
- Uncertainties

3.1.2 WRIA 40a/b

WRIA 40a Watershed Plan Restoration Objectives

The *WRIA 40a Watershed Plan* (RH2 Engineering, Inc. 2007) developed objectives for desired future conditions within the Squilchuck and Stemilt basins. Phase 1 (discussions) and Phase 2 (assessment work) of the Plan led to the development of three general principal recommendations, which are listed in the general order of the Planning Unit's priority:

1. Increase the availability of water, the reliability of the water supply, and/or increase water use efficiency.

2. Improve the management of water and related land resources in WRIA 40a.

3. Improve the understanding of the hydrology of WRIA 40a.

Objectives were organized by sub-basin, and ranked and revised based on the information obtained during the development of the *Water Quantity Assessment* (2007), the *Multi-Purpose Water Storage Assessment* (2007) and the preliminary draft of the Watershed Plan during WRIA 40a Planning Unit (Planning Unit) meetings (RH2 Engineering, Inc. 2007). Planning Unit objectives identified in the *WRIA 40a Watershed Plan* focus primarily water storage and address the three objectives listed in the plan and above. These are in the general order of ranking, as follows:

1. Perform emergency infrastructure repairs to ensure continued system operation.

2. Upgrade existing water reservoir storage and irrigation water distribution systems for water conservation and continued safety protection (fire suppression water). The availability of fire suppression water protects the watershed and natural resources within the WRIA. If this area were to experience a catastrophic wildfire, it would drastically impact the water balance in the area because of changes to runoff and evapotranspiration that would occur.

3. Implement cost-effective new water storage projects in both the Stemilt and Squilchuck Creek watersheds to sustain flow during the agricultural water use period and the fall low flow period.

4. Obtain needed data to enhance the water balance developed by RH2 as part of the watershed planning effort and consider the water balance in all decisions related to water supply in the WRIA 40a study area.

5. Evaluate artificial snow-making and reservoir construction at the Mission Ridge Winter Sports Area to determine opportunities for enhancing water delivery in terms of timing and flow in the Squilchuck Creek watershed.

6. Where feasible, transfer existing interruptible Columbia River water rights to non-interruptible sources. Coordinate with Ecology's Columbia River Water Management Program (CRWMP) to ensure this issue is adequately addressed in that effort.

7. Where feasible, provide domestic water from the regional water supply to support future residential and industrial development in WRIA 40a.

In addition to the objectives above, the *WRIA 40a Watershed Plan* (RH2 Engineering, Inc .2007) identifies the following goal toward implementing restoration:

8. Work with CCNRD and other State and local agencies to protect identified wetland, riparian and ground water recharge areas.

Planned and implemented restoration projects addressing goal number 8 are listed in Table 3-8 of the *Final WRIA 40a Detailed Implementation Plan* (WRIA 40a Planning Unit 2008). Habitat issues are addressed with projects that include channel connectivity, off-channel habitat, culvert removal and improvement, bank stabilization, and habitat enhancement.

WRIA 40a Watershed Plan Restoration Implementation Strategies, Benchmarks, and Funding

The *Final WRIA 40a Detailed Implementation Plan* (WRIA 40a Planning Unit 2008) calls for concurrent implementation of the three general principal recommendations and the eight objectives above. The Planning Unit applied the same prioritization process to each goal and objective. The Implementation Plan employs flexibility in its strategy so that variable water needs, available funds, and commitment to projects may be accommodated. The strategy calls for determining targets for instream flow and acceptable instream habitat loss by conducting studies on the Wenatchee River and tributaries. Periodic review is part of the strategy, as is the pursuit of funding through partnerships and innovative means. Implementation schedules depend on size and complexity of projects, funding, permitting, and the capacity of involved parties to complete projects. Near-term funded actions were scheduled for implementation in 2008

to 2011 at the time of Implementation Plan completion. Implementation of 50 percent of near-term unfunded actions (top-tier priority only) was scheduled for 2009 to 2013 implementation; the remaining 50 percent and 50 percent of second-tier projects are scheduled for 2014 to 2018. The remaining projects of second-tier priority are scheduled for implementation. All remaining second- and third-tier projects are to be implemented in 2019 to 2023. Evaluation of the status of water reservation is scheduled for every five years until 2025.

Three funding mechanisms are addressed in the Implementation Plan. Funds appropriated by the State legislature for watershed planning implementation will be used primarily for first- and second-tier projects and implementation of the *WRIA 45 Watershed Management Plan*. Secondly, implementing entities (Ecology, CCNRD, BOR, SRFB, and BPA, for example) have made unspecified finding commitments. Finally, grant funding will be coordinated with other processes, such as the Chelan County Lead Entity process and the CCD. Additional funds for projects not funded through these avenues may be sought from a variety of sources, included other State agency grants, other SRFB funding, BPA grants, and many private sources, which can be located through the Boise State University Finance Center website at http://efc.boisestate.edu/watershed/searchmenu.asp.

Washington Department of Fish and Wildlife Diversion Screening and Fish Passage Inventory Report for Colockum Creek, Stemilt Creek and Squilchuck Creek Objectives

The Washington Department of Fish and Wildlife (WDFW) completed a *Diversion Screening and Fish Passage Inventory Report for Colockum Creek, Stemilt Creek and Squilchuck Creek* in 2006. The goal of the inventory was to 1) assess unscreened or inadequately screened surface water diversions and 2) identify fish passage barriers and to assess the potential available habitat gain for each feature. Data obtained from the diversion screening and fish passage inventory and concurrent habitat survey will allow for prioritization for correction of noncompliant surface water diversions and fish passage barriers to ensure compliance with Washington State laws. The report identifies an additional goal toward shoreline restoration in WRIA 40a/b: In the area of Colockum Creek within the shoreline jurisdiction, at least five barriers to fish passage were identified. These are all recommended for removal or repair, as they block anadromous salmonids access to suitable habitat.

Washington Department of Fish and Wildlife Diversion Screening and Fish Passage Inventory Report for Colockum Creek, Stemilt Creek and Squilchuck Creek Implementation Strategies, Benchmarks, and Funding

The goals of the *Diversion Screening and Fish Passage Inventory Report for Colockum Creek, Stemilt Creek and Squilchuck Creek* (WDFW 2006) to assess surface water diversion and fish passage issues were largely completed during the inventory process. The results yielded the third goal in the preceding section, the removal

and/or repair of fish passage barriers. The potential fish barrier projects were also ranked and prioritized as part of the inventory. No timeline or implementation strategy was included in the analyses. This, a recommended first step would be to completed a detailed implementation plan for fish passage barrier projects in the three creeks. Potential funding sources include many of those listed in the preceding paragraph.

3.1.3 WRIA 45

Planning Unit Objectives

The Wenatchee Watershed Planning Unit, which includes Chelan County and the Cities of Wenatchee, Cashmere and Leavenworth, has a defined mission "to collaboratively develop a management plan for sustaining and improving watershed and community health." To implement this plan, the WRIA 45 Planning Unit's goal is to: "protect water resources, habitat and water use in a way that balances the educational, economic and recreational values associated with a healthy community." The WRIA 45 Planning Unit will work to achieve this goal by meeting the following three objectives:

1. Assess water supply and use, and develop strategies for meeting current and future needs for both in-stream and out-of-stream use (Water Quantity and Instream Flow Subcommittee).

2. Protect and enhance habitat of threatened and endangered and culturally important species throughout the Wenatchee Watershed, improving overall habitat function and connectivity (Habitat Subcommittee).

3. Address polluted water bodies that do not meet state and federal water quality standards (Water Quality Technical Subcommittee).

The WRIA 45 Planning Unit identified 25 opportunities for actions in the Wenatchee watershed, including six short-term actions and four hatchery-oriented actions. Details are covered in Volume 1 of the *Wenatchee Watershed Management Plan* (WWMP) (Wenatchee Watershed Planning Unit 2006). These recommended actions and planned implementation strategies meet the WRIA 45 Planning Unit's three objectives by indentifying watershed-wide actions (pertaining to instream flow, quantity, growth and land use, quality, habitat, implementation, and outreach) and sub-watershed specific actions. Tables 2-1 through 2-16 of the WWMP (2006) present summaries of the recommended actions and the agency(s) or entity(s) responsible for implementation; Table 2-6 lists specific implementation actions.

Planning Unit Implementation Strategies, Benchmarks, and Funding

The WWMP suggests that voluntary, cooperative measures are preferable to regulatory enforcement approaches. Implementation actions in the WWMP may need additional assessment and planning before implementation can proceed and responsibilities can be assumed, and that funding considerations may limit the implementation process, although federal entities are expected to support the strategies in the plan within the limits of available financial resources.

Funding sources for recommended actions would be determined by the implementation entity. Examples of potential private and public funding sources include Aquatic Lands Enhancement Account (ALEA), Bonneville Environmental Foundation Watershed Program, The Bullitt Foundation, Coastal Protection Fund (CPF), The Compton Foundation Environmental Grants, Family Forest Fish Passage Program (WDNR), Fish America Foundation Conservation Grant, Riparian Habitat Protection in the Washington Wildlife and Recreation Program (WWRP), and the UCSRB.

The UCSRB *Draft Upper Columbia Spring Chinook Salmon, Steelhead, and Bull Trout Recovery Plan* (2005) calls for administrative reviews to assess project implementation success, as well and for monitoring of recovery actions for their effectiveness in fulfilling goals. The WWMP also recommends an adaptive management strategy for actions that may require further development, additional data collection, or subsequent modification.

The *Wenatchee River Integrated Status and Effectiveness Monitoring Program* (ISEMP) is also in place to evaluate and document the progress and success of habitat actions. The ISEMP is a collaborative effort funded through various federal, state and local efforts. It builds on existing monitoring programs and consists of pilot status and trend monitoring efforts for anadromous salmonids and their habitat, as well as effectiveness monitoring for suites of habitat restoration projects in the Wenatchee Watershed.

Wenatchee River Channel Migration Zone Study Objectives

CCNRD conducted a *Wenatchee River Channel Migration Zone Study-Phase I* in 2003. The purpose of the CMZ Study Phase I was to provide the technical foundation to allow the selection and prioritization of salmonid habitat restoration, enhancement, and preservation projects (Jones and Stokes Inc. 2004). The study objectives were to 1) evaluate historic changes in channel behavior and vegetation for the lower Wenatchee River (from Leavenworth to the mouth) and some of its tributaries (mouths of the Icicle, Peshastin and Mission Creeks, and the lower four miles of Nason Creek), 2) project areas where these rivers and streams may migrate or erode their banks in the future, and 3) identify potential restoration sites to improve salmon habitat (CCNRD website).

Phase II of the CMZ Study was subsequently completed to quantify physical and biological mechanisms linked to the salmonid habitat limiting factors, and prioritize potential habitat restoration, enhancement, and preservation actions. Twenty-four restoration sites were selected for preservation, enhancement, or restoration. The sites included areas that could be preserved because of their existing high-quality habitat adjacent to the Wenatchee River, and their need for additional off-channel habitat and riparian vegetation. The CCNRD has made it a goal to restore and protect these 24 sites.

Wenatchee River Channel Migration Zone Study Implementation Strategies, Benchmarks, and Funding

Potential restoration and protection opportunities are reviewed by CCNRD in an ongoing manner. No timetable or implementation strategy specific to the 24 sites listed in the CMZ study exists. Rather, the sites will be considered as viable options for restoration and preservation activities discussions. Funding for restoration and preservation projects may differ, as some public funds and private entities may be available solely for one of these project types. For example, one of the projects (identified as CMZ 2, and referenced in the WWMP) was initiated by a private property owner and then was finalized and will be constructed by the Yakama Nation using Bonneville Power Administration mitigation funds. The Boise State University Finance Center website (http://efc.boisestate.edu/watershed/searchmenu.asp) provides a potential listing of available grants and other funds for the projects and sites suggested in the CMZ study.

Upper Valley Plan Objectives

A Steering Committee and the Chelan County Public Utilities District (CCPUD) partnered to develop a vision plan with opportunities for the upper Wenatchee River valley, including the communities of Leavenworth, Peshastin, Dryden, Cashmere, and Monitor. They identified goals, objectives and a list of potential river access sites and fisheries enhancement opportunities along the Wenatchee River.

A summary of the *Upper Valley Plan*'s purpose was to: 1) identify interpretive sites, river access points, and fisheries and wildlife enhancement opportunities along the Wenatchee River corridor, that have the potential to increase the public's knowledge and understanding of CCPUD's salmon and wildlife habitat enhancement programs; and to 2) build on existing tourism by creating attractions, new tourism opportunities (with an emphasis on the environment, education, recreation, culture, and art), visibility of the valley's resources, leveraging efforts of other groups that share common goals, and protect and enhance natural habitats (J.T. Atkins & Company PC. 2003). The plan identifies opportunity sites in:

1. Leavenworth (at the Leavenworth National Fish Hatchery, Blackbird Island, Icicle Creek/Wenatchee River confluence, irrigation projects, Wenatchee River habitat work, Icicle Loop Trail, potential interpretive trail at an old railbed site east of Leavenworth, gateway for "back roads" scenic drive, and Trout Unlimited projects).

2. Peshastin (at an old mill site, mill intake station, old railroad corridor, Kiwanis Park, Main Street, a historic log structure, Peshastin Creek/Wenatchee River confluence, and at railroad bridge and sandy beach).

3. Dryden (at a beaver pond site, dam site, powerhouse site, old school site, downtown Dryden, old dump site and public access above railroad and between railroad and SR 2).

4. Cashmere (at the Chelan Co. museum, a fishing hole on the north shore of the Wenatchee R., Old Mill, Raft Park and PUD kiosk, a flood area below Bethlehem construction, Goodwin Bridge, and Devil's Gulch mountain bike area).

5. Monitor (at Sleepy Hollow viewpoint, Green Bridge, gateway for "back roads" scenic drive, irrigation site, Monitor Bridge, riparian area, Chelan Co. Park, Wenatchee Foothills trail).

Upper Valley Plan Implementation Strategies, Benchmarks, and Funding

Implementation plans for the Upper Valley Plan goals begin obtaining 501c3 for the Steering committee, hiring a project director, and acquiring office space and equipment. Community meetings and meetings with reviewing agencies to determine permitting requirements are the following step. The remainder of the plan is aimed at identifying and procuring funding. Potential funding sources are not specified but may include both acquiring project specific funds from private and public entities as well as teaming to complete projects with existing programs and groups such as the Chelan-Douglas Land Trust, Washington State Department of Transportation, The Audubon Society, and CCNRD.

Washington Department of Ecology Total Maximum Daily Load (TMDL) Objectives

The U.S. Environmental Protection Agency (EPA) has approved a TMDL (the Wenatchee River Watershed Dissolved Oxygen and pH Total Maximum Daily Load Water Quality Improvement Plan (TMDL) (Ecology 2009). The TMDL identified three water bodies in the project area exceeding dissolved oxygen standards and six exceeding pH standards. The overarching goal of the TMDL plan is to meet water quality standards; thus, the goal is to reduce total phosphorus from point and nonpoint sources to the Wenatchee River. The timeline for compliance with water quality standards is 10 years from TMDL

approval, or 2019. Fifty specific activities and goals are identified in Table 5 of the TMDL. They include supporting and regional phosphorus reduction activities, point and nonpoint source activities, facility planning and design, monitoring activities, and habitat improvements.

Washington Department of Ecology Total Maximum Daily Load (TMDL) Implementation Strategies, Benchmarks, and Funding

Three phases and a number of targets are defined to track progress toward goals. Timelines are in Table 3 of the TMDL and summarized below:

Phase/Target	Definition	Timeline
Phase 1	Point and nonpoint source reductions, data collection and model calibration	2009-2013
Target 1	50% nonpoint source loading reduction	2014
Phase 2	Modification of load and wasteload allocations (if needed); identification of additional nonpoint source reductions	2014-2015
Phase 3	Additional load reductions implemented	2015-2019
Target 2a	NPDES compliance	2019
Target 2b	Reduction in remaining nonpoint source poading	2019
Final Target	Water quality standards achieved	2019

Dissolved oxygen and pH data will be collected every five years to monitor progress toward the goals. Adaptive management will be employed to ensure that goals are achieved. Compliance monitoring will continue after compliance with water quality standards is achieved.

A number of funding resources presently support the TMDL or will potentially provide technical assistance or monetary support as projects are implemented. These sources include the CCD, which is a current recipient of a Centennial Clean Water Fund grant for TMDL activities; CCNRD, which provides incentive payments for implementation of riparian restoration activities; NRCS, which provides technical assistance to farmers and ranchers and may also be a funding source; and a number of jurisdictions and entities, including Chelan County, the Chelan County PUD, and the Cities of Wenatchee, Leavenworth, and Cashmere, have all shown interest in investigating sources of nonpoint source phosphorus loading.

3.1.4 WRIA 46

Planning Unit Objectives

The Entiat sub-basin community is recognized as being a leader in restoration planning, implementation and monitoring. The Entiat Watershed Planning Unit (EWPU) has won three awards for its restoration and planning efforts. Restoration projects have been designed and implemented by a variety of agencies, including BLM, WDFW, USFS, and the Natural Resources Conservation Service (NRCS).

The EWPU consists of Entiat valley landowners, government and non-government employees, and other stakeholders. The revised vision of the EWPU (adopted 19 April 2000) is to "voluntarily bring people together in a collaborative setting to improve communication, reduce conflicts, address problems, reach consensus and implement actions to improve coordinated natural resource management on private and public lands in the Entiat Water Resource Inventory Area (WRIA 46)" (CCCD 2004).

The EWPU's *specific goals* are as follows:

1. Optimize quantity and quality of water to achieve a balance between natural resources and human use, both current and projected.

2. Provide for coexistence of people, fish and wildlife while sustaining lifestyles through planned community growth, and maintaining and/or improving habitats.

3. No avoidable human-caused mortality of state and federal threatened, endangered and candidate species.

4. Develop and implement an adaptive action plan to address priority issues, emphasizing local customs, culture and economic stability in balance with natural resources. All actions will comply with existing laws and regulations. However, changes to existing laws and regulations will be recommended as needed to attain our common vision and avoid one-size-fits-all solutions.

5. Recognizing the significance of the roles of limiting factors outside of the watershed and natural events within the watershed, the long-term goal is to have the Entiat River's existing and future habitats contribute to the recovery of listed species and to eventually provide harvestable and sustainable populations of fishes and other aquatic resources.

Planning Unit Implementation Strategies, Benchmarks, and Funding

The *Detailed Implementation Plan Entiat Water Resource Inventory Area (WRIA) 46* (CCCD 2006) provides a framework for implementing habitat restoration actions. The strategy first prioritizes geographic location; next, biological data and primary limiting factors are considered in the prioritization process. While implementation strategies pertain primarily to water quantity and instream flow issues (See Chapter 9 of the *Detailed Implementation Plan*), the *Entiat Water Resource Inventory Area (WRIA) 46 Management Plan* (CCCD 2004) resulted in a number of potential habitat projects that are also recommended for consideration. The Plan places importance on channel restoration, LWD placement, side channel and floodplain reconnection, streamside revegetation, fish passage, and community outreach.

Monitoring strategies outlined in the plan focus on maintaining favorable natural resources trends, implementing habitat improvements that address limiting factors, and ensuring that Management Plan (CCCD 2004) goals are being met. Monitoring items (e.g., water quality, noxious weeds, wetlands, etc.) are identified; monitoring techniques appropriate to the type of project are suggested; the responsible entities are identified; and a monitoring schedule (frequency and duration) specific to the project type is determined. Evaluation of monitoring results is required to meet legal responsibilities, and adaptive management is recommended. Funding sources include Ecology Phase 4 grant funds, general Washington Conservation Commission/ County operating funds, federal operating funds and legislative appropriations, partner grants, and agreements.

The EWPU hopes that their "living" watershed management plan will grow, advance, and improve over time. In keeping with that spirit, the EWPU views this document as a "working" *Entiat Water Resource Inventory Area (WRIA) 46 Management Plan* (CCCD 2004). The EWPU fully anticipates that the Plan will be revisited and updated in the years to come. Within Appendix A of the *Entiat Water Resource Inventory Area (WRIA) 46 Management Plan* (CCCD 2004), the EWPU proposed 21 potential restoration projects within the Entiat sub-basin and 3 projects within minor Columbia River tributaries. This living and working document can be found online at the Cascadia Conservation District website at: http://www.cascadiacd.org/index.php?page_id=255.

Entiat Tributary Assessment

The Bureau of Reclamation (BOR) (U.S. Department of the Interior) recently completed an *Entiat Tributary Assessment* (2009) that summarized impacts and restoration opportunities related to channel and floodplain complexity in the lower 26 river miles of the Entiat River. This information is intended to provide technical information to decision makers to assist with restoration planning

efforts. To summarize, human impacts to the Entiat River channel and floodplain primarily occur within the lower 26 river miles, and have not significantly altered the large-scale morphological characteristics of the river. Impacts are generally limited to localized areas where specific disturbances have occurred (i.e. levees or channelization) and do not extend far upstream or downstream of the impacted area (BOR 2009).

The analysis provided the extent of human impacts to river processes that may offer opportunities for restoration. In turn, this analysis also showed where river processes have not been significantly impacted and offers opportunities for protection from future anthropogenic impacts.

In the *Entiat Tributary Assessment* (BOR 2009), Table 17 summarized findings for geomorphic reaches within three valley segments. The BOR successfully identified opportunities for improving habitat complexity through channel and floodplain restoration or enhancement efforts. Six reaches had the highest potential to improve steelhead or spring Chinook salmon habitat complexity by addressing present impacts, and four reaches were recommended for further analysis prior to development of recommended restoration concepts. Recommendations for additional analysis included addressing habitat, vegetation, hydraulic, and morphology data gaps.

Upper Columbia Salmon Recovery Plan Objectives

The *Upper Columbia Salmon Recovery Plan* (UCSRB 2007) identified general habitat actions for the Lower Entiat and Middle Entiat to address limiting factors that include:

1. Riparian restoration: Improving riparian conditions along the Entiat River and adjacent floodplain to improve bank stability, shading, and potential for LWD recruitment.

2. Floodplain restoration and enhancement: Improving channel and floodplain function including increased connectivity where blocked off, increased lateral migration and reworking of the active floodplain where artificially constrained, and addressing altered channel geometry where it has been disrupted due to channel straightening or bank protection.

3. LWD restoration and enhancement: Increasing amounts of LWD in the main channel or off-channel habitat areas, taking into account the role of LWD for a given geomorphic setting.

4. In-channel restoration: Generally implies construction of in-channel features to create man-made scour pools and slower velocity areas where channel and floodplain restoration cannot occur due to existing land use

constraints, or where new habitat is desired to increase habitat availability to mitigate for other impacts possibly even those outside of the subbasin.

5. Road maintenance: Addressing bridges and roads that are no longer in use or that impede channel and floodplain processes, particularly those with embankments that alter floodplain inundation. Floodplain inundation may be more frequent in areas upstream of constricted floodplain sections (backwater), or may be less frequent in areas no longer accessible due to features that cut off access to the floodplain

6. Obstruction restoration: Removing barriers to fish migration; no fish passage issues were identified along the mainstem Entiat River

7. Water quality and quantity: Improvement of water characteristics including temperature, nutrients, contaminants, and flow quantity during low-flow periods.

Upper Columbia Salmon Recovery Plan Implementation Strategies, Benchmarks, and Funding

Implementation of the above actions is intended to be voluntary under the coordination of a UCSRB Implementation Leader, to be hired, and Implementation Team. The Team will facilitate implementation, monitoring, and adaptive management of projects. Responsibilities of the Team will include identifying benchmarks for each project, tracking progress, preparing progress reports for the public and interested agencies and entities, incorporating the Upper Columbia Regional Technical Team's (RTT) (created by the UCSRB to recommend region-wide approaches to protect and restore salmonid) work to ensure that effective monitoring and analysis are implemented.

The adaptive management strategy will employ a Water Action Team (WAT) to work with UCSRB to update implementation schedules if needed, and to facilitate monitoring to promote consistency across the region. A representative nominated by the WAT will coordinate funding sources, implementation schedules on a regional scale, monitoring, and adaptive management. The RTT will also be responsible for project technical review. Detailed monitoring and review processes for the Recovery Plan as a whole are described in the Plan (UCSRB 2007).

Funding sources for the restoration projects taken from the UCSRB Recovery Plan (2007) are the following:

1. The Washington Salmon Recovery Board

2. PUD funds

3. The BPA Fish and Wildlife Program
4. The Federal Columbia River Power System Biological Opinion
5. State agencies budgets (WDFW, Ecology, Conservation Districts
6. NMFS Pacific Coast Recovery Fund
7. Federal agencies monies appropriated by the U.S. Congress (Corps, USFWS, USGS, USFS, NRCS, BOR, and BLM)
8. Local government finding through state legislative appropriations
9. NGOs, including the National Fish and Wildlife Foundation, regional fishery enhancement groups, and the Bullitt Foundation
10. NOAA's Community-Based Restoration Program
11. Public and private partnership funding for voluntary projects

3.1.5 WRIA 47

WRIA 47 Final Draft Planning Unit Charter Objectives

The Lake Chelan Watershed (WRIA 47) Planning Unit's vision is to "recognize, inform, educate, monitor, understand and protect the unique water resource that is Lake Chelan; the ecological processes and pathways essential to maintaining this high quality water body, and the ways in which we can live on this lakeshore, enjoy this unique treasure and protect it for generations to come."

The WRIA 47 Planning Unit has the goal "to implement a management plan for water use and protection that sustains the environmental, educational, economic and recreational values associated with a healthy lakeside community and watershed." The following objectives were outlined in the *WRIA 47 Final Draft Planning Unit Charter* (2008):

1. Assess water supply, use and projected needs.
2. Develop and implement a comprehensive, long-term monitoring program of key parameters that will ensure water quality sustainability throughout the Lake Chelan Watershed.
3. Address waterbodies with constituents on the State 303(d) list and other parameters of potential concern that threaten lake water quality.
4. Inform and educate local communities and visiting populations about water quality protection.

5. Develop a Water Quality Improvement Plan and Water Quality Management Plan to understand, restore and protect water resources.

WRIA 47 Final Draft Planning Unit Charter Implementation Strategies, Benchmarks, and Funding

Strategies for achieving the plan objectives are summarized as follows in the *WRIA 47 Final Draft Planning Unit Charter* (2008):

1. Fully engage all stakeholders through an open, accessible and collaborative process.

2. Develop clear objectives, decision-making and evaluation processes, and planning products to ensure accountability for implementation.

3. Identify gaps in the understanding of water resource issues within the watershed. Develop a scope of work to address important issues using credible scientific information to understand, protect and restore the most critical aspects of a healthy watershed.

4. Use new and existing information to forge a plan to meet stated objectives.

5. Integrate the watershed planning process and ensuing plan with other programs, initiatives and activities affecting the Lake Chelan Watershed.

As a separate goal, a Watershed Plan is presently being completed and will include restoration goals and recommendations. CCNRD is the lead entity on this project, proposed for draft submittal to the CCNRD in June 2010.

Funding of the efforts will be pursued on a project-by-project basis by various lead entities, including the initiating governments of WRIA 47 under the Watershed Planning Act (RCW Chapter 90.82). These governments are Chelan County, the City of Chelan, and the Lake Chelan Reclamation District. Each of these initiated the watershed planning process by applying for grants from Ecology. Implementation funds for recommended actions will be drawn from a number of grants and other sources, including State grants of up to $500,000 per WRIA. No timeline is defined for the general goals. A number of them overlap with other plans and activities described in this document.

Lake Chelan Subbasin Plan Objectives

The *Lake Chelan Subbasin Plan* (Berg 2004) established the goal to "restore conditions to a more natural state" by employing "ecosystem-based perspectives that consider multiple species, their life histories, and their inter-relationships." The Subbasin Plan includes a detailed inventory, and concludes with a number of habitat or biological objectives for key species and key habitats in the basin.

Many of the objectives are to conduct additional species/habitat assessments, "identify and provide biological and social conservation measures to sustain focal species populations and habitats," and in a number of instances to "[m]aintain and/or enhance habitat function (i.e., focal habitat attributes) by improving silvicultural practices, fire management, weed control, livestock grazing practices, and road management…" Below are terrestrial and aquatic general restoration and conservation strategies suggested in the *Lake Chelan Subbasin Plan* (2004):

Terrestrial

- Improve habitat quantity and quality by emphasizing conservation, protection, and connectivity of large blocks of high quality focal habitat.
- Protect and restore beaver habitat and, where possible, prepare for reintroduction into suitable habitat where natural recolonization may not occur.

Aquatic

- Increase populations of westslope cutthroat trout by reducing direct harvest impacts and eliminating introductions of, and/or removing, non-native species.
- Reintroduce bull trout to form self-sustaining nonmigratory populations. Measures that support this goal include reducing abundance of non-native fish, maintaining suitable habitat and ecosystem-wide processes, and increasing harvest on competitor or predator fish.
- Increase the abundance and productivity of kokanee to ensure self-sustaining populations by increasing harvest of Chinook salmon and lake trout, reducing the abundance of mysids, and planting appropriate numbers of hatchery fish.

Lake Chelan Subbasin Plan Implementation Strategies, Benchmarks, and Funding

The Lake Chelan Subbasin Plan outlines suggested strategies toward achieving the goals listed above. These are summarized for terrestrial and aquatic goals.

Terrestrial

A general strategy to move toward the goal of terrestrial habitat protection and conservation is described in the Subbasin Plan: "Strategies to achieve this goal include promoting local planning and zoning, utilizing governmental plans and programs, implementing habitat stewardship projects with private landowners, and protecting lands through acquisition, conservation easements, and cooperative agreements."

Another proposed general strategy addresses beaver habitat directly: "Both the fish and wildlife portions of this management plan provide strategies to protect

and restore beaver habitat and, where possible, to prepare for reintroduction into suitable habitat where natural recolonization may not occur. The restored habitat would benefit beaver, whose activities would in turn benefit the salmon and steelhead that use the watershed for a portion of their life history…The plan also provides for the maintenance of mule deer populations and ensures their habitat needs are met."

Strategies and recommendations call for the involvement of government, NGO and/or land managers, or some coordinated effort between these groups.

Specific strategies and suggested timelines include the following actions:

- Identify existing quantity and quality of habitat (2008).
- Survey populations of focal species (2008).
- Utilize existing government and private programs to conserve habitat, with priority for large blocks and high connectivity (2010).
- Develop and implement fire management protocols (protection and prescribed burning), and weed control and road management plans (unspecified/subsequent to 2010 strategies).
- Monitor wildlife focal species (unspecified/subsequent to 2010 strategies).
- Implement federal, state and tribal management and recovery plans (unspecified/subsequent to 2010 strategies).
- Institute beaver protections, including harvest restrictions and reintroduction (unspecified/subsequent to 2010 strategies).

Aquatic

The Subbasin Plan generally calls for promoting self-sustaining kokanee and westslope cutthroat trout through harvest reduction and eliminating non-native species, and for reintroducing bull trout. The following strategies are aimed at achieving the aquatic goals of the Subbasin Plan.

- Eliminate introductions of nonnative species that may impact westslope cutthroat trout by completing a comprehensive stocking plan (complete by 2010).
- Remove cutthroat trout spawning barriers (remove in first year, monitor spawning activity and success in two subsequent years).
- Increase Chinook salmon and lake trout harvest limits (plan for decreased abundance by 2015).
- Remove brook trout and rainbow trout harvest limits (plan for decreased abundance by 2015).
- Identify early life history requirements of cutthroat trout and determine whether kokanee spawning interferes with fry emergence (studies should span 6 to 10 years, with yearly reports).

- Examine life history requirements of other species that may interact with cutthroat trout (studies should be two years in length with draft and final reports).
- Delay fishing season until after cutthroat trout spawning.
- Determine if bull trout are present in the basin through exploration of potential habitat areas (study should be two years in length with draft and final reports).
- Preserve or restore bull trout spawning habitat.
- Reduce abundance of competing introduced fish (2010).
- Determine predator-prey relationships for Chinook salmon and lake trout (Five-year study effort with yearly reports).
- Institute bull trout reintroduction program (2010).

Funding sources for recommended actions are not specified. However, funding for each project could be pursued from a variety of sources, including those specified elsewhere in this document.

3.2 City of Cashmere

The *City of Cashmere Comprehensive Land Use Plan* (2008) is intended to be a guide for the growth and development within and surrounding the community that is both sensitive to the environment and to guide the needs of the community residents. Environment-related goals of the plan are as follows:

1. Encourage the most appropriate use of land throughout the community.

2. Conserve and protect and restore natural beauty and other natural resources.

The City of Cashmere is a member of the Wenatchee Watershed Planning Unit, and as such is committed to supporting the relevant objectives and actions of the *Wenatchee Watershed Management Plan*. As reported in the *Shoreline Inventory and Analysis Report* (TWC and J&S 2009), the *Wenatchee Watershed Management Plan* (Wenatchee Watershed Planning Unit 2006) includes four specific habitat actions for the Lower Wenatchee Watershed, which includes the City of Cashmere:

- LowWenH-1: Use practical and feasible means to increase stream flows (within the natural hydrologic regime and existing water rights) in the Wenatchee River (UCSRB 2005).
- LowWenH-2: Reduce water temperatures by restoring riparian vegetation along the river (UCSRB 2005).
- LowWenH-3: Increase habitat diversity and quantity by restoring riparian habitat along the Wenatchee River, reconnecting side channels and the

floodplain with the river, and increasing large woody debris in the side channels (UCSRB 2005).
- LowWenH-4: Protect existing riparian habitat and channel migration floodplain function (UCRTT 2002).

Five separate habitat actions, as follows, are included for the Mission sub-watershed:

- MissionH-1: Re-establish connectivity throughout the assessment unit by removing, replacing, or fixing artificial barriers (culverts and diversions) (UCSRB 2005).
- MissionH-2: Use practical and feasible means to increase stream flows (within the natural hydrologic regime and existing water rights) in Mission Creek (UCSRB 2005).
- MissionH-3: Decrease water temperatures and improve water quality by restoring riparian vegetation along the stream (UCSRB 2005).
- MissionH-4: Reduce unnatural sediment recruitment to the stream by restoring riparian habitat and improving road maintenance (UCSRB 2005).
- MissionH-5: Increase habitat diversity and quantity by restoring riparian habitat, reconnecting side channels and the floodplain with the channel, increasing large woody debris within the channel, and by adding instream structures (UCSRB 2005).

Several of the water-quality actions for the lower Wenatchee watershed address inputs of nutrients, particularly phosphorus to the Wenatchee River. Many parks and other intensively maintained lawns or landscape areas are potential sources of nutrient run-off. The Plan specifically mentions a need to reduce phosphorus inputs from wastewater treatment plants, including the City of Cashmere's facility, and notes that the City is one of several members of a partnership formed to address dissolved oxygen and pH problems that are related to phosphorus. The Plan also includes 19 water-quality actions in the Lower Wenatchee Watershed and 33 water-quality actions for the Mission sub-watershed.

The *Wenatchee Watershed Management Plan* provides guidelines regarding implementation strategies, timelines, and potential funding sources. These are described in Section 3.1.3 of this document.

3.3 City of Chelan

The *City of Chelan Comprehensive Land Use Plan* (2007) is intended to implement comprehensive land use planning at the local level, maintain local decision making power, and promote desired changes. An element to the Plan is the

Parks and Recreation Comprehensive Plan 2008-14 (2007). The mission of the Chelan Parks and Recreation Department is to "build a great community through people, parks, and programs." It also includes a commitment to managing and expanding the community's resources, including conservation of natural resources and support for the City's economic vitality (City of Chelan Parks and Recreation Department 2007).

The Department established goals and objectives, including priority actions. The environment protection goal is listed below.

PRG 6.0: Protect and preserve as open space areas that: are ecologically significant sensitive areas; provide significant opportunities for restoration buffers between uses and link open space; provide trails and/or wildlife corridors; or enhance fish habitat.

The City of Chelan's *Strategic Plan 2008-2009* (2008) vision statement includes relevant information "to preserve and improve the quality of life for the citizens of the community and for visitors to the area by achieving/creating….the preservation of natural resources and water quality….and a commitment to maintaining existing city resources/facilities" (City of Chelan 2008). The City of Chelan's mission statement again mentions the provision of "maintenance and preservation of existing resources/facilities/neighborhoods with a focus on community sustainability…." (City of Chelan 2008). The relevant strategic goal and objectives were defined as follows:

- Goal: To improve the quality of life and environment in the Lake Chelan area;

- Objective: Complete Don Morse Park Master Plan and initiate phased development with a focus on shoreline stabilization, beach enhancement, and reassessment of size of marina;
- Objective: Create a City sustainability plan.

As previously mentioned, the City of Chelan is an initiating government in development of a watershed management plan for the Chelan watershed. Because this plan is still in preparation, there are currently no identified projects or timelines. However, the City is committed to developing and implementing its future actions and/or programs consistent with the already agreed upon goals and objectives. See discussion under 3.1.5 above for more detail.

3.4 City of Entiat

In the *City of Entiat Comprehensive Land Use Plan* (2009), the Entiat Planning Area Statement of Intent is:

> *"to provide a guide for development for the citizens of the Entiat Planning Area. The plan will strive to maintain the existing quality of life that includes: culture, customs, economy, agricultural opportunities, sense of community, water quality, and recreational opportunities. This plan should provide for expansion of these opportunities and promotion of commercial waterfront development, while maintaining an adequate infrastructure to accommodate this growth. Continuous public participation is warranted, with decision-making and implementation at the local level."*

The City of Entiat believes that goals provide the motivating force behind all planning efforts. Therefore, the following goals related to environmental protection or restoration were established utilizing provisions of the Shoreline Management Act and Guidelines as a basic theme, in combination with the ideas and evaluation of the Citizens Advisory Committee (from City of Entiat 2009a, Section 6.1):

1. Promote reasonable and appropriate use of the shorelines which will not jeopardize public and private interests.

2. Protect against adverse effects to the public health, the land, its vegetation and wildlife, and the waters and their aquatic life within Chelan County.

3. Protect rights of navigation.

4. Recognize and protect private property rights.

5. Maintain or recreate a high quality of environment along the shorelines of the County.

6. Preserve and protect fragile natural resources and culturally significant features.

7. Increase public access to publicly owned areas of the shorelines where increased levels are desirable.

8. Protect public and private properties from the adverse effects of improper development in hazardous shorelines areas.

9. Recognize the importance of an informed and responsible public, observing basic rules of good behavior in the use and enjoyment of all shorelines.

In the case of those shorelines that have been designated as having statewide significance, the City of Entiat recognizes the following protection goals (City of Entiat 2009a, Section 6.2):

1. Recognize and protect statewide interest.
2. Preserve or enhance the natural character of the shoreline.
3. Address uses which result in long-term over short-term benefit.
4. Protect the resources and ecology of the shorelines.
5. Increase public access to publicly owned areas of the shorelines where increased use levels are desirable.
6. Increase recreational opportunities on the shorelines open to the public.

More specific goals that include an environmental protection element are as follows (City of Entiat 2009a, Section 6.3):

Economic Development Goal: Permit those commercial and industrial[3] developments requiring shorelines locations which may contribute to the economic well-being of the City of Entiat with minimum disruptions of the environment.

Public Access Goal: Assure safe, convenient and diversified access to the public shorelines of the City of Entiat; assure that the intrusions created by public access will not endanger life or have adverse effects on property or fragile natural features; assure that the provisions for public access will minimize conflicts between public and private property.

Circulation Goal: Since the major transportation systems pre-exist near many shorelines, additions or modifications to these systems should minimize the conflicts between those systems and shorelines uses.

Recreational Element Goal: Assure diverse, convenient, and adequate recreational opportunities along the public shorelines of the City of Entiat for the local residents and a reasonable number of transient users.

Shoreline Use Goal: Assure an appropriate pattern of sound development in suitable locations without diminishing the quality of environment along the shoreline of the City of Entiat.

[3] Note: The City will be updating this goal in a future Comprehensive Plan update as industrial development will not be allowed in the City's shorelines.

Historical/Cultural Element Goal: Protect and restore areas having significant historic, cultural, educational, or scenic values.

Conservation Goal: Assure preservation of unique, fragile and scenic elements; assure conservation of non-renewable natural resources; assure continued utilization of the renewable resources such as timber, water and wildlife.

Rehabilitation Goal: Encourage the restoration of shoreline areas which have been modified, blighted, or otherwise disrupted by natural or human activities.

The City of Entiat was an initiating government and is a member of the Entiat Watershed Planning Unit (EWPU), and as such has committed to "coordinat[ing] their policy and planning activities in a manner that compliments and helps support overall EWPU goals" (Chelan County Conservation District 2006).

3.5 City of Leavenworth

As reported in the *Analysis Report* (TWC and J&S 2009), the City of Leavenworth is engaged in a number of cooperative restoration efforts with Trout Unlimited and U.S. Fish and Wildlife Service (USFWS). The City is working with Trout Unlimited to enhance ponds in public recreation areas, including Enchantment Park and Blackbird Island. The north channel of the Wenatchee River around Blackbird Island is the subject of a study by USFWS for inclusion of large woody debris to provide instream habitat.

The City of Cashmere is a member of the Wenatchee Watershed Planning Unit, and as such is committed to supporting the relevant objectives and actions of the *Wenatchee Watershed Management Plan*. Four habitat actions for the lower Wenatchee watershed previously mentioned for the City of Cashmere (identified in the WWMP) are relevant to City of Leavenworth's Wenatchee River and Chumstick Creek shorelines. Five separate habitat actions, as follows, are included for the Chumstick sub-watershed, which is located for a small area at its downstream end in the City of Leavenworth:

ChumH-1: Re-establish connectivity throughout the assessment unit by removing, replacing, or fixing artificial barriers (culverts and diversions) (UCSRB, 2005).

ChumH-2: Use practical and feasible means to increase stream flows (within the natural hydrologic regime and existing water rights) in Chumstick Creek (UCSRB, 2005).

ChumH-3: Decrease water temperatures and improve water quality by restoring riparian vegetation along the stream (UCSRB, 2005).

ChumH-4: Increase habitat diversity and quantity by restoring riparian habitat, reconnecting side channels and the floodplain with the channel, increasing large woody debris within the channel, and by adding instream structures (UCSRB, 2005).

ChumH-5: Protect remaining floodplain and riparian habitat (UCRTT, 2002).

Several of the water-quality actions for the lower Wenatchee watershed address inputs of nutrients, particularly phosphorus to the Wenatchee River. The *WWMP* (WWPU 2006) specifically mentions a need to reduce phosphorus inputs from wastewater treatment plants, including the City of Leavenworth's plant, and notes that the City is one of several members of a partnership formed to address dissolved oxygen and pH problems that are related to phosphorus. To date, the cities and town sites within the Upper Valley area are working to determine all sources of phosphorus contamination, as there appears to be very little loading capacity for phosphorus in the area. The *WWMP* (WWPU 2006) also includes 20 water-quality actions in the Chumstick sub-watershed.

3.6 City of Wenatchee

The *Planning to Blossom 2025 Wenatchee Urban Area Comprehensive Plan* (2008) states that "scenic resources and open space have become topics of community preservation and value. These natural resources are intrinsic to Wenatchee's identity and attraction and need to be protected." The Wenatchee vision statement identified by locals in 2002 reads, "the City will protect and enhance its natural setting and environmental quality, including the surrounding hillsides, shorelines, and scenic vistas."

The City of Wenatchee and the CCPUD developed a long range *Wenatchee Waterfront Sub-Area Plan* (2003). Plan goals and objectives look at the Waterfront as a whole and identified what needs to happen on a global perspective. Environment protection goals are as follows:

Parks, Recreation, and Shoreline Goal: Preserve and enhance Wenatchee's system of waterfront park and trails.

Shoreline and Environment Goal: Upgrade the environmental quality of the shoreline and larger waterfront area.

More information about this Sub-Area Plan is available online at the City's website: http://www.wenatcheewa.gov/Index.aspx?page=79.

The City of Wenatchee was an initiating government and is a member of the Wenatchee Watershed Planning Unit, and as such is committed to supporting the relevant objectives and actions of the *Wenatchee Watershed Management Plan.* The four habitat actions for the lower Wenatchee watershed previously mentioned for the City of Cashmere (identified in the *WWMP* 2006) are relevant to City of Wenatchee's Wenatchee River shoreline.

4. LIST OF EXISTING AND ONGOING PROGRAMS

4.1 WRIA 40a/b Watershed Plans

As reported in the *Shoreline Inventory and Analysis Report* (TWC and J&S 2009), the *WRIA 40a Watershed Plan* (RH2 Engineering, Inc. 2007) was the deliverable for Phase 3 of the watershed planning process. Phase 4, the implementation plan, is currently underway. Opportunities and strategies for carrying out each of the three principal recommendations presented in Section 3.1.2 above are presented in Table 3 of the *WRIA 40a Watershed Plan* and described in detail in the Plan's Section 3.3. These opportunities will be further evaluated in Phase 4 (implementation) and prioritized based on their feasibility to achieve the desired future conditions in WRIA 40a.

Implementation goals were identified in Appendix D (*Water Quantity Assessment*) and Appendix E (*Multi-Purpose Storage Assessment*) of the *WRIA 40a Watershed Plan* (RH2 Engineering, Inc. 2007). Goals were ranked according to their level of importance and will be implemented by the WRIA 40a Planning Unit as funds become available.

4.2 WRIA 45 Watershed Plans

The WRIA 45 Planning Unit explains in their *Phase IV – Detailed Implementation Plan* [(DIP) April 2008] that:

> *"The Wenatchee Watershed (WRIA 45) has been listed by the State Department of Ecology as one of the 16 basins in the state with critical and inadequate streamflows for fish."*

The WRIA 45 Planning Unit therefore developed an approach and ranking strategy to prioritize actions for implementation of the *WWMP* (WWPU 2006). The DIP (WWPU 2008) provides priorities and a practical schedule for implementing actions previously identified in Volume 1 of the *WWMP* (WWPU 2006), along with additional salmon recovery and water quality related actions that have evolved since the DIP was adopted. This management tool targets the

status and completion of existing and ongoing projects, and can be found in Table 3-2 of the WRIA 45 Planning Unit's *Phase IV – Detailed Implementation Plan* (WWPU 2008).

4.3 WRIA 46 Watershed Plans

The *Entiat WRIA - Detailed Implementation Plan's* (DIP) (CCCD 2006) purpose is "to outline a framework for maintaining or improving the health of the Entiat and Mad River watersheds through implementation of Entiat WRIA 46 Management Plan recommendations." Actions and strategies identified in the *Entiat WRIA 46 Management Plan* (CCCD 2004) will help correct altered conditions and improve or maintain overall watershed health, attain compliance with the Clean Water and Endangered Species Acts, and contribute to the recovery of listed species and opportunities for recreational and tribal fisheries, in accordance with the vision and goals of the EWPU.

The DIP is meant to be a reasonable approach to achieving watershed protection and enhancement in a realistic timeframe under the known physical, political, social and economic limitations. The EWPU has already implemented a number of watershed restoration actions, and has a list of ongoing and long-term projects identified in Table 8 of the *Entiat WRIA - Detailed Implementation Plan* (CCCD 2006). Table 17 of the DIP summarizes ongoing monitoring activities. These tables also outline lead/support agencies that are involved, and includes information about activities that have some degree of funding support associated with them (CCCD 2006).

4.4 WRIA 47 Watershed Plans

The Lake Chelan WRIA 47 Planning Unit assessed 1) water quantity and 2) water quality, by assessing the supply and use in the management area to develop future strategies (RH2 Engineering, Inc. and Geomatrix Consultants 2008 [RH2 and Geomatrix]). The WRIA 47 Planning Unit charter is addressing the recommended strategies detailed in the *Final Draft Planning Unit Charter* (RH2 and Geomatrix 2008).

Management and research, monitoring, and evaluation plans were developed as part of the *Lake Chelan Subbasin Plan* (Berg 2004) to be used by subbasin planners and state salmon recovery personnel to aid in the conservation and restoration of important habitat that will aid in the recovery of focal species. Restoration objectives and strategies that were identified in the plan are underway, in addition to research, monitoring and evaluation. The research, monitoring and evaluation plan consists of a variety of quantitative elements, ranging from scientific wildlife and vegetation surveys, spatial analyses of project location and acreage, to simple enumeration of land use projects/regulations commented

upon by cooperating agencies. Details about focal species restoration efforts, research, monitoring and evaluation can be found in the *Lake Chelan Subbasin Plan* (Berg 2004).

4.5 Chelan County Natural Resource Department Efforts

The Chelan County Natural Resource Department (CCNRD) administers watershed planning and salmon recovery efforts in Chelan County. Current activities include Wenatchee River Watershed (WRIA 45) planning and implementation, Squilchuck/Stemilt Watershed (WRIA 40a) planning and implementation, a countywide salmon recovery grant program through Washington Salmon Recovery Funding Board, and habitat conservation plan development under the Federal Endangered Species Act (Chelan County website). The CCNRD also supports the Upper Columbia Salmon Recovery Board (UCSRB) and staffs the Chelan County Water Conservancy Board. The CCNRD manages a variety of state, federal, and local project and planning grants that assist watershed planning and salmon recovery efforts in Chelan County. Details about CCNRD programs and funding can be found online at http://www.co.chelan.wa.us/nr/nr_main.htm.

The CCNRD's current restoration strategies and efforts primarily stem from those identified in: watershed plans and DIPs previously mentioned; the *Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan*'s (2007) implementation schedule; and various studies, such as the Wenatchee River CMZ study. The CCNRD also implements "need-based" projects as they arise (E. Fonville, personal communication, March 9, 2009), which may consist of native riparian plantings and stream buffer restoration for private land owners in collaboration with the Chelan-Douglas Land Trust (CDLT).

UCSRB Implementation Schedule

The *Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan* (UCSRB 2007) provides a regionally and federally accepted framework for implementing coordinated recovery actions, while providing a "roadmap" towards implementation of priority habitat actions. The UCSRB has successfully completed single-project-focused actions that 1) reopen tributary habitat, 2) preserve key habitat areas, and 3) protect countless fry and smolt from entrainment in irrigation diversions. One recent project success story, sponsored by the CCNRD, includes the Nason Creek Oxbow Reconnection project in the upper Wenatchee valley (located between mile post 0.83 and 1.33 on Hwy. 207). This project reconnected a half-mile-long oxbow (secondary channel) by installing two 12-foot-wide fish-friendly culverts. The reconnection restored access to 21.7 acres of off-channel refuge, rearing and over-wintering habitat for juvenile salmonids.

While these single-project-focused actions significantly contribute to recovery efforts, "there is a growing consensus among biologists, project managers and the entities providing salmon recovery funding, that the greatest current opportunities for habitat restoration projects that will yield the greatest biological benefits are found in the yet to be addressed large-scale, multi-years, multi-million dollar recovery activities" (UCSRB 2009). In a recent memo regarding funding and project coordination of salmon recovery projects in the Upper Columbia, UCSRB members state that "the priority of the UCSRB is to restore salmonid populations … through the development of a mid-range implementation/3-year work plan and coordinated funding." The UCSRB is currently updating their comprehensive, coordinated and strategic approach to restoration to address the "large-scale, multi-year, multi-million dollar recovery activities." The implementation plan that the CCNRD works from can be found online at http://www.ucsrb.com/theplan.asp. Implementation actions pertain to: water quantity and quality, water temperature extremes, habitat diversity and quantity, obstructions, riparian/floodplain, sediment, diversions, species interactions, depleted nutrients, nutrient limitations, and ecosystem function.

Outreach and Education

The CCNRD sends out mailers (postcards) updating the community about educational workshops and workgroups, such as the Shoreline Master Program update meetings.

4.6 Comprehensive Plan Policies

At the beginning of the planning process, the County and the Cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee opted to divide the County into eight study areas and prepare a plan for each area. The County took the lead role, in coordination with the cities in the development of seven sub-area plans. The City of Wenatchee took the lead role in the development of a comprehensive plan for the Wenatchee Urban Area.

4.6.1 Chelan County

The *Chelan County Comprehensive Plan* (2005) was developed in accordance with Section 36.70A.070 of the Growth Management Act to address land uses. The Plan covers the unincorporated areas outside of the city urban growth areas. Seven study areas were indentified within the county-wide plan, encompassing the following study areas: Chelan-Manson, Entiat Valley, Malaga-Stemilt-Squilchuck, Lower Wenatchee River Valley, Upper Wenatchee River Valley, Plain-Lake Wenatchee, and Stehekin (Chelan County 2005). Unincorporated areas of the County within UGA boundaries are covered by the city comprehensive plans.

A Rural Coordinating Committee, made of 12 members appointed by the Board of Commissioners to coordinate the Rural Element of the Plan, together with the Planning Commission, went through a process where they identified goals and policies applicable to specific study areas, and goals and policies applicable county-wide. The Comprehensive Plan represents the County's policy plan for growth to the year 2017 and can be found online: http://www.co.chelan.wa.us/bl/data/compplan.pdf. In particular, the Plan expresses a goal of identifying and protecting critical areas and mitigation adverse impacts that may result from reasonable use. Policies include encouraging the enhancement and restoration of fish and wildlife habitat. Projects pertaining to habitat are to be defined implemented by landholders and other involved party on a case-by-case basis.

4.6.2 City of Cashmere

The *City of Cashmere Comprehensive Land Use Plan "The Heart of Cashmere"* (January 14, 2008, Ordinance 1117) is intended to guide the needs of residents and environment throughout growth and development within and surrounding the community. Because the "community" of Cashmere extends beyond the actual city limits, it is important that this plan and the *Chelan County Comprehensive Plan* (2005) are complementary. Countywide planning policies as well as the overall policies of the GMA are intended to assure that all levels of government are communicating and working towards respective plans that are compatible and consistent. The Comprehensive Plan describes general goals and objectives that will be used to make decisions that balance the needs and desires of the residents of the Cashmere area. The Plan should clearly state the community's vision for future growth and development, as the city zoning codes, building codes and land use regulations will be established or updated.

Goals of the plan are as follows:

1. Encourage the most appropriate use of land throughout the community.
2. Lessen traffic congestion and accidents.
3. Secure safety from fire.
4. Encourage the formation of neighborhood or community units.
5. Secure an appropriate allotment of land area in new developments for all the requirements of community life.
6. Conserve and protect and restore natural beauty and other natural resources.

7. Facilitate the adequate provision of transportation.

4.6.3 City of Chelan

This *City of Chelan Comprehensive Land Use Plan* (2007) was prepared by the citizens of the Chelan Planning Area of Chelan County and the City of Chelan to address growth issues in the Chelan Planning Area. It represents their land use policy and plan for growth to the year 2017. Separate documents are also an element of this plan, and include a Comprehensive Sewer Plan, Comprehensive Water Plan, and Parks Plan. In developing the *City of Chelan Comprehensive Land Use Plan* (2007), the Citizen's Advisory Committee found that the Economic Development Element is a leading driver of the entire plan, addressing more of the thirteen goals of the Growth Management Act (GMA).

4.6.4 City of Entiat

The *City of Entiat Comprehensive Land Use Plan* (2009) provides for urban land use designations in the City and UGA, and addresses other important elements such as capital facilities (e.g. parks and recreation). The Comprehensive Plan was prepared by the citizens of Entiat to address growth issues in the Entiat Planning Area. It represents their land use policy plan for growth into the future.

The Entiat Citizens Advisory Committee developed a statement of intent that took care to list characteristics of the community and what they would like to see happen in the future. Their following statement of intent for the Planning Area states, "The intent of this Comprehensive Plan is to provide a guide for development for the citizens of the Entiat Planning Area. The plan will strive to maintain the existing quality of life that includes: culture, customs, economy, agricultural opportunities, sense of community, water quality, and recreational opportunities. This plan should provide for expansion of these opportunities and promotion of commercial waterfront development, while maintaining an adequate infrastructure to accommodate this growth. Continuous public participation is warranted, with decision-making and implementation at the local level" (City of Entiat 2009, Section 1.5).

4.6.5 City of Leavenworth

The *City of Leavenworth Comprehensive Plan* (2003) was prepared by the citizens of the Leavenworth/Upper Wenatchee River Valley Planning Area, the City of Leavenworth Planning Commission, and the Leavenworth City Council to address growth issues in the City of Leavenworth and its UGA. It represents the City's growth policies for the next 20 years. The vision of area residents is expressed in the following statement:

> *"The citizens of the planning area envision maintaining the uniqueness of the area which combines a quality "rural/small community" lifestyle with a*

diversified economic base that allows orderly growth and development while preserving the beauty of the area with open spaces and enhancing the proper management of the natural environment."

The goals and policies found in the Comprehensive Plan are deemed to be essential in maintaining a satisfactory quality of life for the planning area. A City of Leavenworth open space/recreation goal mirrors the City's vision by stating that Leavenworth will "conserve open space and encourage open space considerations in future development."

4.6.6 City of Wenatchee

The City of Wenatchee developed their *Planning to Blossom 2025 Wenatchee Urban Area Comprehensive Plan* (2007) with a vision based upon the views expressed by local residents. Three subjects were considered to be the most important determinants in Wenatchee's future: 1) economic development, 2) quality of life, 3) and learning and human services. Detailed policies can be found in the *Planning to Blossom 2025 Wenatchee Urban Area Comprehensive Plan* (2007).

4.7 Critical Areas Regulations

Chelan County and the Cities of Cashmere, Chelan, Entiat, Leavenworth and Wenatchee each have their own set of critical area regulations that dictate protection of environmentally sensitive areas, including wetlands, streams (fish and wildlife habitat conservation areas), geologically hazardous areas, frequently flooded areas, and aquifer recharge areas. All regulations use a version of Ecology's Eastern Washington Wetland Rating System. For specific protection of critical areas in shoreline jurisdiction, the Shoreline Master Program contains for the County and each City a revised set of regulations that meets the Shoreline Management Act and Shoreline Master Program Guidelines' more specific requirements and standards.

4.7.1 Chelan County

Chelan County's critical areas regulations were recently updated (2007), and are considered to be consistent with Growth Management Act "best available science" standards. No further revisions to the regulations in the near future are anticipated. Many of the issues and concerns that guided the development of the critical area regulations were discussed and addressed in the comprehensive planning process. The GMA also requires the provision for the protection of the quality and quantity of ground water used for public water supplies. The land use element is also required to review; where applicable, drainage, flooding, and storm water run-off and to provide guidance for corrective actions to mitigate or cleanse those discharges that pollute waters of the state. Chelan County set the

following goals, with associated policies that can be found in the Comprehensive Plan.

Goal 1: Protect water quality.

Goal 2: Protect and maintain air quality.

Goal 3: Ensure that development minimizes impacts upon significant natural, historic, and cultural features and to preserve their integrity.

Goal 4: Identify and protect critical areas and provide for reasonable use of private property while mitigating adverse environmental impacts.

Goal 5: Within the upper Wenatchee River valley study area, encourage retention of the scenic character and environmental quality of the Icicle valley.

4.7.2 City of Cashmere

The *City of Cashmere Comprehensive Land Use Plan "The Heart of Cashmere"* (2008) states, "the quality of life of different communities is directly related to the quality of environmental factors, such as air and water quality…subtle and prolonged degradation of these things can undermine the community's appeal and viability." Therefore, following requirements of the Growth Management Act (GMA) and using the "best available science", the Comprehensive Plan provides reference maps, a description of the City's classification and designation of critical areas, as well as goals and policies to protect them.

The City's general goal is to "preserve and protect the quality of the area's natural features and maintain a harmonious relationship between the man-made community and the natural environment" (City of Cashmere 2008). More specific goals are as follows:

Goal: The City's wetlands will be protected to the greatest extent possible because they provide important functions that help define the quality of life in the community.

Goal: Protect fish and wildlife habitat areas as an important natural resource for the City, particularly in regard to their economic, aesthetic and quality of life values.

Goal: The City seeks to protect the public health, safety and welfare of its residents by providing protection of potable water sources, primarily through careful monitoring and control of areas demonstrated to be critical aquifers and/or which play a crucial role in recharging our groundwater supplies.

Goal: Protect the frequently flooded areas that are known to be critical parts of the natural drainage system by limiting and controlling potential alterations and/or obstructions to those areas.

Goal: The City will provide appropriate measures to either avoid or mitigate significant risks that are posed by geologic hazard areas to public and private property and to public health and safety.

The City's critical areas regulations are currently being updated.

4.7.3 City of Chelan

The *City of Chelan Comprehensive Land Use Plan* (2007) follows the recommendation of the Growth Management Act (GMA) by adopting goals and policies to "protect critical areas," that include wetlands, geologically hazardous areas, aquifer recharge areas, fish and wildlife habitat conservation areas and frequently flooded areas. The City of Chelan established critical area goals and policies that were adopted in 1998 (City of Chelan 2007) as follows:

- Goal 1: Protect water quality

Policy 1: Support the —keep it blue and other water quality education programs which inform local citizens and visitors about water quality issues and ramifications.

Policy 2: Ensure that storm water is not directly discharged into water sources without appropriate treatment that meets federal, state, and city standards.

Policy 3: Encourage the appropriate regulatory agencies to actively pursue violators that illegally discharge waste into rivers, lakes and streams.

Policy 4: Development along the shoreline shall comply with federal, state, and City guidelines to ensure minimum impact on water quality.

Policy 5: Support ongoing measures by the Lake Chelan Reclamation District, Chelan County Conservation District, area orchardists, and other related agencies and groups, as they raise awareness levels, and monitor and mitigate water quality issues related to agriculture.

Policy 6: Boat launches should incorporate wash-off stations to remove milfoil off of boats prior to entrance to the Lake. Boaters should be educated about the negative impacts of milfoil to the clarity and quality of Lake Chelan.

Policy 7: Where erosion is occurring, and can be found to not be of natural origin, measures should be allowed to amend the situation. Rationale: This helps protect lake water quality, as well as private property.

- Goal 2: Permit development to occur in known natural hazard areas only when sufficient safeguards protecting life and property can be met.

Policy 1: Discourage development in areas of natural hazard such as those susceptible to landslide, flood, avalanche, unstable soils and excessive slopes, unless appropriate safeguards are taken.

Policy 2: Provide slope protection, erosion control, soil stabilization, and fire protection when appropriate.

- Goal 3: Encourage development that takes into consideration significant natural features and protects their integrity.

Policy 1: Encourage preservation and proper maintenance of significant natural drainage ways.

Policy 2: Encourage the conservation or preservation of critical areas, such as wetlands, migratory animal routes, etc., by supporting plans that provide for public and private organizations to purchase these lands.

Policy 3: Allow for recreational development to make use of natural amenities on critical areas when the recreational use has minimal impacts.

- Goal 4: Protect and maintain air quality

Policy 1: Support the wood stove standards recently adopted by the Department of Ecology

Policy 2: Recognize the potential benefits of public water, rail, electric, alternative fuels, non-motorized and air transportation in helping maintain local air quality.

Policy 3: Ensure that new industrial development meets air quality standards and does not significantly affect adjacent property.

Policy 4: Poor air quality should not degrade the agricultural industry.

The City of Chelan's environmental regulations are found in the *Chelan Municipal Code*, Chapter 14.10, and are currently being updated. These regulations "establish special standards for the use and development of lands based on the existence of natural conditions and features including geologically hazardous areas, critical aquifer recharge areas, frequently flooded areas, fish and wildlife conservation areas and wetlands."

The standards and procedures established in Chapter 14 are intended to protect environmentally sensitive areas while accommodating the rights of property owners to the use of their property in a reasonable manner. The following is a direct excerpt from the municipal code, Chapter 14.10:

> *"These environmentally sensitive areas are of special concern to the city…. By regulating development and alterations to sensitive areas this chapter seeks to:*
>
> 1. *Protect members of the public and public and private resources and facilities from injury, loss of life, property damage or financial losses due to erosion, landslide, seismic events or steep slope failure;*
>
> 2. *Protect unique fragile and valuable elements of the environment, including canyon areas and wetlands;*
>
> 3. *Mitigate unavoidable impacts to environmentally sensitive areas by regulating alterations in and adjacent to those areas; 4) Provide city officials with the information and authority to protect sensitive areas and implement the policies of the State Environmental Policies Act, RCW 43.21C, the city of Chelan Comprehensive Plan and the Growth Management Act of 1990. (Ord. 944 § 1 (part), 1992)."*

4.7.4 City of Entiat

The City of Entiat has adopted critical area regulations in 2006, consistent with best available science and all other requirements of the GMA. The goals and policies were outlined in the *City of Entiat Comprehensive Land Use Plan* (2009) and "are intended to provide some measure of protection to the environmental elements that contribute to the quality of life in the community."

The general goal is the same as the City of Cashmere, to "preserve and protect the quality of the area's natural features and maintain a harmonious relationship between the man-made community and the natural environment" (City of Entiat 2009). The City of Entiat identified more specific goals, which again are the same as the City of Cashmere, and can be found in that section above.

4.7.5 City of Leavenworth

The City of Leavenworth initially adopted goals and policies in response to the requirements of the GMA as part of its Comprehensive Plan adopted in 1996. In 2002 and 2003 this information was updated incorporating the use of "best available science". The City completed the planning process for developing critical area regulations following an extensive citizen participation process, and will be further updating those critical areas regulations in 2009. Critical area policies found in the *City of Leavenworth Comprehensive Plan* (2003) follow the goals below:

Goal 1: Encourage land use practices that protect the integrity of the natural environment to ensure that the community has an adequate source of clean water and air and to otherwise maintain a healthy human environment.

Goal 2: Use best available science in classifying, designating, and regulating, critical areas within the City of Leavenworth.

Goal 3: Provide flexibility in regulation of land uses in critical areas, recognizing that the GMA encourages development within cities in order to limit the geographic extent of human impacts.

Goal 4: Identify and protect critical areas and provide for reasonable use of private property while mitigating adverse environmental impacts.

Goal 5: Protect water quality.

Goal 6: Protect and maintain air quality.

Goal 7: Ensure that development minimizes impacts upon significant natural, historic, and cultural features and preserves their integrity.

4.7.6 City of Wenatchee

The City Wenatchee has adopted the Resource Lands and Critical Area Development Ordinance (City of Wenatchee 2009). The Ordinance does not designate agricultural lands of long-term commercial significance but assures the continued use of farm lands for agricultural purposes. The City of Wenatchee will "protect public safety and the ecological functions of critical areas by mitigating development depending on area characteristics" (City of Wenatchee 2007). The *Planning to Blossom 2025 Wenatchee Urban Area Comprehensive Plan* (2007) lists regulatory policies as follows:

Policy 1: Ensure any development in critical areas adequately mitigates potential negative impacts associated with the specific conditions.

Policy 2: Review and expand critical area designations and associated development regulations for accuracy, effectiveness, and utilization of best available science.

Policy 3: Designate fish and wildlife habitat corridors along the waterfront and in the foothills where appropriate.

Policy 4: Designate within the UGA, frequently-flooded areas in accordance with Federal Emergency Management Act (FEMA) criteria.

Policy 5: Encourage the use of clustered development and other innovative designs that aim to preserve the functions of critical areas and further public safety.

The City completed an update of its critical areas regulations in early 2009.

4.8 Stormwater Management and Planning

4.8.1 Chelan County

The storm drain system for Chelan County's roads consists primarily of roadside ditches and culvert pipes for drainage under roads and driveways. Stormwater is generally directed to roadside ditches that discharge directly into local waters. In more urbanized areas, a limited number of piped drain systems are in place. These areas include Olds Station, Sunnyslope, Peshastin, Leavenworth, and Manson. The piped systems are located where it was necessary to construct a roadway with curb, gutter and associated catch basins.

The Chelan County Public Works Department has developed a Stormwater Management Plan for the Olds Station area that is adopted by reference as part of the *Chelan County Comprehensive Plan* (2005). The Port of Chelan County is in the process of developing more storm systems in the Olds Station area. Within the County portions of the Entiat and Leavenworth UGA's, stormwater systems consist of a system of roadside drainage ditches (City of Entiat 2007 and City of Leavenworth 2001). The storm ditches within the Leavenworth UGA will need to be tight-lined into the City storm system when land is developed (City of Leavenworth 2001).

4.8.2 City of Cashmere

As described in the *City of Cashmere Comprehensive Land Use Plan "The Heart of Cashmere"* (2008), stormwater drainage facilities are available throughout most of the City. Major components of the system consist of piping, manholes, catch basins and outfalls. Extensions to the stormwater system are primarily done by land development and the cost of the extension is borne by the developer. The City of Cashmere will be evaluating the stormwater system for Ecology's Phase II, Stormwater Management Regulations compliance in the near future.

4.8.3 City of Chelan

Adopted as part of the *City of Chelan Comprehensive Land Use Plan* (2007), a limited storm drainage system in Chelan uses a combination of surface and subsurface means to collect and drain stormwater. In most cases, the subsurface drainage system is located under major streets in the present downtown area and is discharged into Lake Chelan. The City of Chelan will develop a stormwater plan to further address existing and future stormwater facilities.

4.8.4 City of Entiat

According to the City's Comprehensive Plan, the City of Entiat did not have any stormwater drainage systems until very recently (City of Entiat 2009). New subdivisions have stormwater facilities, generally consisting of grassy swales, catch basins and large detention areas, whereas earlier subdivisions used an open ditch system. The *City of Entiat Comprehensive Land Use Plan* (2009) explains that the City now requires new development to install curbs and gutters to convey stormwater. There are no current plans to implement a city-wide stormwater drainage system, aside from when new development occurs.

4.8.5 City of Leavenworth

The *City of Leavenworth Comprehensive Plan* (2003) describes the City's existing storm sewer system as a network of catch basins, inlets, pipelines, and manholes which function to collect and transport surface run-off for eventual discharge to the Wenatchee River. There are portions of paved road that do not allow drainage into the catch basins, due to improper paving of the roads. The City may undertake a joint stormwater runoff study with Chelan County and the USFS for the Ski Hill area of Leavenworth. They may also adopt an ordinance that requires oil/water separators for parking lots, commercial and multifamily structures, per Ecology's recommendations (City of Leavenworth 2003).

4.8.6 City of Wenatchee

The City of Wenatchee has developed many control measures required for stormwater management programs, since the federal National Pollutant Discharge Elimination System (NPDES) requirements went into effect in 2003. All development within the City is required to control stormwater such that it doesn't damage adjoining properties, route to City system if capacity is available, extend City infrastructure in accordance with the *Planning to Blossom 2025 Wenatchee Urban Area Comprehensive Plan* (2007), and will provide water quality treatment for all construction activities. All commercial development must address water quality on site and some must be capable of detaining stormwater in flood events. The City also routinely sweeps streets to help keep debris out of the storm drain system. Most of the City of Wenatchee is connected to the stormwater collection system that discharges directly into local waters. The City of Wenatchee presented a policy in the Comprehensive Plan to establish review requirements so that all development projects do not adversely impact the rate and amount of runoff into adjacent waters or lands.

The *Planning to Blossom 2025 Wenatchee Urban Area Comprehensive Plan* (2007) provides options being considered for future City of Wenatchee stormwater:

1. Low Impact Development - Explore the use of low impact development techniques in city streets, new and redevelopment so as to decrease the volume of stormwater entering the City system and surrounding waters.

2. Extend Stormwater Requirements - Require all new development and appropriate redevelopment to infiltrate stormwater on site.

3. Education - Continue efforts to inform the public about stormwater's effects on water quality, the way the City's stormwater system works, and how individual actions affect stormwater.

4.9 Public Environmental Education

4.9.1 Chelan County

The *Chelan County Comprehensive Plan* (2005) describes eight visions of the citizens of the Lower Wenatchee River Valley Study Area, including one that pertains to an "educational climate." As part of providing "an economic and educational climate that enables our citizens to find suitable employment within the valley," environmental education and respect for natural resources is highly evident throughout county and partner activities. County environmental education and stewardship is highly influenced and supported by the surrounding forest and park lands, vast natural resources and beauty, and associated managing and guiding agencies. Several of the agencies and community groups involved in local education have been described in the sections below.

The Board of County Commissioners approved an initial set of county-wide planning policies on May 26, 1992. One of the policies included pertains to public education and citizen participation (Chelan County 2005). Chelan County does provide public education and accepts citizen involvement pertaining to Comprehensive Plan information, rationale and goals, as well as changes that will take place in the County with the Plan's implementation (Chelan County 2005).

4.9.2 City of Cashmere

The City of Cashmere's Riverside Center is a gathering place for music, culture and educational activities within the City. People living in and around Cashmere also utilize City parks for swimming programs, sports leagues, school and youth programs, and community events. The City has an existing Park Plan, part of the *City of Cashmere Comprehensive Land Use Plan "The Heart of Cashmere"* (2008), that identifies that the parks should be developed to perform two different and distinctive functions: 1) provide facilities for the City's residents, therefore making Cashmere a more desirable place to live; and 2) provide

facilities for the visitors who come into the area, thereby enhancing the City's economy.

The City's Parks and Recreation goal is to, "encourage the retention of open-space and development of recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks." A policy associated with this goal links schools and natural resource education to parks.

> Policy: Cooperate with and support Cashmere School District in making school property available for public recreational use.

4.9.3 City of Chelan

The City of Chelan shows support for educational activities, such as art, aquatics, athletics, outdoor, cultural, special event, recreation, enrichment, parks, golf, adaptive, health, fitness, wellness, safety and other program areas as stated in the Parks and Recreation Comprehensive Plan 2008-14 (2007) definition of recreation. The City of Chelan's Riverwalk Park, owned and operated by the Chelan County Public Utilities District, provides a one-mile scenic river loop trail and performing arts pavilion that seasonally hosts regional musicians and performers, benefiting the recreation, education and culture of the community. City of Chelan policies that support education and natural resources can be indentified in the Parks and Recreation Comprehensive Plan (2007) policies below:

> PRP 1.2: Maximize the use of parks, schools, recreation and open space resources within the City by connecting them with a coordinated system of trails.
>
> PRP 4.2: Park, recreation and open spaces which exhibit one or more of the following characteristics shall be designated by the City to be of local or regional significance:
>
> a) Contains significant recreation or cultural opportunities or facilities, such as marinas, waterfront access, athletic fields, golf courses, Primary trails, urban wildlife habitat, community entrances, etc.;
> b) Contains unusual or special botanical resources;
> c) Contains environmentally sensitive areas that serve a significant role or provide a significant function in the natural systems within the City;
> d) Is associated in a significant way with an historic event, structure, or person with a significant effect upon the City, state or nation; and

e) Contains public art.

PRG 5.2: Continue to develop and foster partnerships with the Lake Chelan School District to utilize school sites to provide active recreation and cultural facilities. Explore opportunities to co-develop facilities on school property or property adjacent to schools.

4.9.4 City of Entiat

The City of Entiat will continue its public education program following its Comprehensive Land Use Plan adoption in order to inform the entire community about the goals of the plan, as well as the changes that will take place in the planning area because of the plan's implementation (City of Entiat 2009). The City believes that broad support for the plan is crucial for effective implementation. The following objectives from the Comprehensive Land Use Plan (2009) address public education related to important resource areas.

> Objective LU 3.3: Identify and encourage the preservation of sites and structures with historical or archaeological significance, particularly those that might generate tourist appeal.
>
> Objective LU 18.4: Encourage the development of an education program that promotes the value of critical areas and that promotes public and private stewardship of these lands.
>
> Objective LU 18.13: Allow for open space and recreational use of critical areas where such use does not negatively impact the critical areas.
>
> Objective ED 2.9: Develop informational kiosks in the waterfront district and appropriate viewing areas or historical sites.

The City of Entiat and numerous local, state and federal agencies (USFS, Ecology, Washington Conservation Corps, Entiat School District, NCW AmeriCorps, Washington State Department of Natural Resources, Entiat Community Historical Society, Greater Wenatchee Community Foundation and Chelan County PUD) are developing a plan for an outdoor learning center to be located along the Entiat River. The Learning Center will consist of a day-use facility and interpretive center located on Chelan County PUD land at the Entiat River confluence with the Columbia River to a point upstream approximately one-third of a mile (City of Entiat 2007). More detail about the Learning Center is found in Section 4.10.2 below.

4.9.5 City of Leavenworth

The *City of Leavenworth Parks and Recreation Comprehensive Plan* (1997) considers "outdoor recreation" to be the principal reason for living in Leavenworth.

Therefore the City recognizes the importance of parks and recreation services for the health, social and economic benefits of the resident population, and the enjoyment derived by visitors to the City. These services encompass programs and facilities that educate and foster stewardship within the community.

The use of parks, school facilities and natural resources for recreation purposes by residents and visitors alike has long been an established part of Leavenworth's lifestyle and business interests. Thus, two workshops were hosted during the development of the *City of Leavenworth Parks and Recreation Comprehensive Plan* (1997). Community members were asked to focus on recreation programs and service needs within the City. The need for recreation classes was rated to be the third highest priority for recreation programs within the community. In 1997, when the Parks and Recreation Comprehensive Plan was finalized, only two recreation classes (martial arts and summer arts and crafts) were offered. A considerable list of future classes of interest is provided in the plan. Historical and cultural activities for residents and visitors were also identified to be important to the community participants. The plan concluded that, "it would appear that the City of Leavenworth is the appropriate leader in developing historical and cultural assets for the benefit of the community and its residents and visitor populations as a function of recreation."

4.9.6 City of Wenatchee

The City of Wenatchee's Natural Environment element in the *Planning to Blossom 2025 Wenatchee Urban Area Comprehensive Plan* (2007) includes several policies and potential options for maximizing the implementation and effectiveness of public environmental education:

1. Encourage environmental education, learning opportunities and partnerships for shoreline and habitat opportunities

2. Continue efforts to inform the public about storm water's effects on water quality, the way the City's storm water system works, and how individual actions affect storm water.

3. Promote water conservation in buildings, appliances, landscaping, and daily life through public outreach and informational materials.

4. Work with Chelan County Noxious Weed Control Board to increase public awareness and promote volunteer clean-up action [of noxious weeds].

5. Be an active player in education and involvement programs that raise public awareness about environmental issues, advocate respect for the

environment, and demonstrate how individual and cumulative actions directly affect our surroundings.

6. Work in cooperation with public agencies, local organizations, associations, departments, and groups in creating and carrying out environmentally related programs and outreach efforts.

7. Create informational documents with green building methods and local resources to aid new development in utilizing "green" techniques.

One of the goals established in the *Wenatchee Waterfront Sub-Area Plan* (2003) is to develop an environmental education center/urban agricultural center.

4.10 Additional City Efforts

4.10.1 City of Chelan

The City of Chelan is undergoing Shoreline Restoration and Beach Enhancement planning at Don Morse Park. This project's key goals are to stabilize the shoreline, expand sandy beach areas, enhance water-based recreational opportunities, improve views and access to the Lake, increase opportunities for tourism and economic development, address existing safety and accessibility issues, and restore shoreline areas. Plan details can be found online: http://www.cityofchelan.us/parks/pdfdocs/donmorseparkmasterplanexecsummary.pdf.

The City also recently received a grant from the Washington Department of Ecology to re-vegetate with native plants a 4,300-square-foot area on the steep bank area up-lake of the Don Morse Park marina. This native planting area will improve habitat for birds, fish and other aquatic species.

4.10.2 City of Entiat

The City of Entiat has identified future shoreline parks and public access opportunities including a shoreline trail associated with the *Lake Entiat Waterfront Business District Subarea Plan* (2009b). According to the Subarea Plan, the trail in the redevelopment area is intended to connect with a trail along the shoreline at Entiat City Park, to the south of, and progress under the Entiat River Bridge to connect with the proposed Entiaqua trail. A conceptual plan for a loop trail could connect the east end of the Entiaqua trail to the north end of the waterfront trail at the Columbia Breaks Fire Interpretive Center via irrigation district right-of-way. The trail would be flanked by restored riparian areas along much of its length.

The City is working to develop the Entiat River Outdoor Learning Center located on the Entiat River near its confluence with the Columbia River. This proposal

involves the development of day-use and interpretive facilities on the River (City of Entiat 2008). Facilities are anticipated to include parking, education facilities, a swim platform, trails and paddle boat haul-out.

The above efforts of the City are consistent with the *Entiat Water Resource Inventory Area (WRIA) 46 Management Plan* (CCCD 2004), which includes a project titled "Entiaqua River Park and Outdoor Learning Center" as #9 on its list of restoration projects for the Entiat Subbasin.

The Chelan County PUD also conducted its own assessment of recreation needs as part of the Rocky Reach Dam relicensing effort. The PUD's assessment included conceptual plans for Entiat City Park, as well as the Entiaqua trail (Chelan County PUD 2004).

The Entiat Watershed, and specifically an orchard enterprise on the Entiat River, is the geographic area of a pilot study for the Habitat Farming Enterprise Program (HFEP) (GeoEngineers 2007). HFEP is a program being developed by the Initiative for Rural Innovation and Stewardship (IRIS), in cooperation with North Central Washington Resource Conservation and Development, the Entiat Watershed Planning Unit, Cascadia Conservation District, Chelan-Douglas Land Trust, Chelan County, and several other environmental interests. The HFEP pilot is evaluating the benefits and costs of compensating area farmers to grow riparian habitat and accommodate other restoration measures on their property, in lieu of growing marketable crops. The potential of the HFEP to realize significant improvement in shoreline functions is high.

4.10.3 City of Wenatchee

The City of Wenatchee continues to accomplish the goals established in the *Wenatchee Waterfront Sub-Area Plan* (2003). Restoration-related elements of the park/open space/recreation implementation opportunities include: waterfront park and shoreline enhancement and the development of an environmental education center/urban agricultural center.

4.11 Audubon Society Efforts

The North Central Washington (NCW) chapter of the Audubon Society is dedicated to furthering the knowledge and conservation of the environment of North Central Washington, our Nation, and the World (NCW Audubon website). Chapter president, Mark Oswood, expresses the goals, hopes, aspirations, and plans of the NCW Audubon Society to: promote resource decisions based on the best available data; be honest brokers in environmental conflicts; believe that sustainable economies are the only road into the future; believe in citizen science and life-long learning; act as "outside consultants" – leading field trips, holding outdoor classes, and doing "dirt work"; and watch,

count and protect birds, "one of the grandest expressions of life" (NCW Audubon website).

NCW Audubon is a frequent contributor and partner in several area events and programs that educate and foster stewardship within the community, including the annual *Leavenworth Spring Bird Fest* and the *Wenatchee River Salmon Festival*. Both of these are venues for a NCW Audubon Society birding simulation activity for kids and families, called "What's That Bird?" (M. Oswood, e-mail communication, March 7, 2009). NCW Audubon volunteers assist with outdoor education programs at these events and at events for local students, primarily held at the Barn Beach Reserve (in Leavenworth). The NCW chapter of the Audubon Society also participates in the Wenatchee River Watershed (WRIA 45) Planning effort and the Stemilt-Squilchuck Partnership. The *Wild Phlox*, a NCW Audubon Society newsletter (edited by Teri Pieper), reaches approximately 450 members across the four-county (Chelan, Douglas, Okanogan, Ferry) chapter territory, providing monthly environmental updates and opportunities for Audubon birders and environmental enthusiasts alike. More information about the NCW Audubon Society can be found online at http://www.ncwaudubon.org.

4.12 Cascadia Conservation District Efforts

Watershed Planning

The Cascadia Conservation District (CCD) (formerly the Chelan County Conservation District) is the lead entity for the Entiat (WRIA 46) watershed planning effort, and is also involved with the Wenatchee (WRIA 45) watershed planning effort, led by Chelan County. Since 1993, Entiat area landowners have been working with the CCD to develop local solutions to natural resource issues specific to the basin. The CCD coordinates quarterly Entiat Watershed Planning Unit meetings, monthly Entiat Habitat Sub-Committee meetings, and numerous water quality and quantity meetings. The CCD and its partners generate and update Entiat watershed reports, the Entiat Watershed Plan, and the Entiat Watershed Detailed Implementation Plan.

Land Owner Assistance Program

Numerous projects occur each year, with recent projects along Chumstick Creek, Colockum Creek, Mission Creek, Stemilt Creek, Yaksum Creek, and the Entiat and Wenatchee Rivers (R. Malinowski, personal communication, February 17, 2009). The CCD has assisted in diverse ways by providing: side channel reconnection, off-channel juvenile salmonid rearing habitat, installation of LWD structures and boulder structures for instream habitat complexity, native riparian plantings to stabilize streambanks and provide canopy cover, installation of livestock fencing, elimination of fish entrainment in irrigation diversions through designing and updating new fish screens, and construction of groundwater wells

to replace surface water diversions. Primarily the CCD works with private landowners to enhance riparian areas while providing fish-friendly conveyance to irrigation ditches, thereby reducing annual instream disturbance from diversion maintenance. By installing instream log cross vanes, LWD (with intact rootwads) and boulder clusters, irrigation pools are allowed to form (with fish screens), minimizing diversion impacts to fish and stream habitat. The CCD continues to assist local landowners and watersheds.

Water Metering

In an effort to encourage voluntary compliance with state metering requirements, the CCD has partnered with the Washington State Department of Ecology to provide cost-share funding to assist Chelan County diversion owners with the installation of adequate metering equipment.

Education and Outreach

- *Kids in the Creek*

  Cascadia Conservation District participates in the *Kids in the Creek* program that was developed by local volunteers. This program won First Place for 2006 Environmental Education Curriculum from the National Association of Interpretation Media. The objectives of the program show how streams and watersheds work. Students walk away with an understanding of how their actions can affect stream health, in both negative and positive ways. They learn about watersheds, stream habitat, water quality, riparian areas, and macroinvertebrates. More information about the *Kids in the Creek* program can be found online: http://www.bpa.gov/corporate/KR/ed/kidsinthecreek/homepage.htm

- *Streamside Property Owner's Guide*

  The CCD developed the *Streamside Property Owner's Guide* for the Entiat Watershed to provide county residents with an understanding of the critical riparian habitat along the stream. The guide includes "7 Steps to Stewardship" - a list of contacts and sources of information to assist with riparian planning and activities (R. Malinowski, personal communication, February 17, 2009).

- *Wenatchee River Salmon Festival*

  The CCD participates in the *Wenatchee River Salmon Festival*, hosted annually by the Leavenworth National Fish Hatchery and the Okanogan and Wenatchee National Forests. The festival's mission is to "provide high quality natural resource education, promote outdoor recreation, and share the cultural significance of salmon to the people of the Northwest."

Information about the Wenatchee River Salmon Festival can be found online at http://www.salmonfest.org.

For more details, contact the Cascadia Conservation District by phone (509) 664-9370 or look them up on the internet at http://www.cascadiacd.org.

4.13 Chelan-Douglas Land Trust Efforts

Land Protection

The Chelan-Douglas Land Trust (Land Trust) protects lands throughout the County, either through conservation easements or acquisition (B. Bugert, e-mail correspondence, February 13, 2009). Land is eligible for Land Trust protection based on the following qualifying criteria:

- Is it habitat for endangered, threatened or rare species?
- Does it contain exemplary natural ecosystems such as old-growth forests or migratory waterfowl staging/wintering areas?
- Does it include shoreline and riparian areas?
- Does it include wetlands, floodplains, or other lands important for the protection of water quality?
- Is it undeveloped land in close proximity to urban development?
- Does it have important recreational opportunities?
- Does it include parcels that could be connected to greenbelt corridors between privately protected or publicly held properties?
- Does it include unique local scenic viewpoints or outstanding physiographic features that help define the character of our locale and enhance our community's sense of place?
- Is it valuable for timber or agricultural production?
- Is it a heritage site of historic and or prehistoric value?
- Does it include ecosystems of educational or scientific value?
- Is the landowner amenable to the conservation goals of the land trust?

Additional Land Trust protection efforts are described below:

- *Riparian Plantings*

  The Land Trust has done work to revegetate riparian habitat along the Entiat River (WRIA 46) at their Cottonwood and Stormy Creek reserves (B. Bugert, e-mail correspondence, February 13, 2009). They are currently collaborating with Chelan County Natural Resources to do riparian plantings along Icicle Creek and potentially future projects throughout the County (B. Bugert, e-mail correspondence, February 13, 2009).

- *Lake Wenatchee and White River*

The Land Trust is working with private landowners, the U.S. Forest Service, the Washington Department of Fish and Wildlife (WDFW), and Chelan County to permanently protect the natural functions and scenic beauty of the White River watershed.

- *Entiat River Valley*

  The Land Trust is actively involved in efforts to protect fish habitat, wildlife habitat, and floodplain function along the "*Stillwater"* reach of the Entiat River. The *Stillwater* is a calm stretch of river that contains the majority of the Entiat's spawning and rearing habitat for endangered steelhead, endangered spring Chinook salmon, threatened bull trout, and fall Chinook salmon. At the urging of local residents, the Land Trust applied for and received a grant for $1.4 million from the state Salmon Recovery Funding Board to purchase nearly 300 acres (including nearly three miles of riverfront) of prime fish and wildlife habitat along the Entiat. The Land Trust is working with Entiat Valley residents to develop management plans that will protect the conservation values of these properties in perpetuity (Chelan-Douglas Land Trust website).

Education and Outreach

- *Chelan County Good Neighbor Handbook*

  To promote community stewardship, the Land Trust publishes the *Chelan County Good Neighbor Handbook* as a tool to ensure people do their part in keeping the County a special place to live. The handbook is available online at:
  http://www.cdlandtrust.org/Good%20Neighbor%20HB%20for%20web.pdf

- *Workshops*

  The Land Trust is working to make the case that land conservation is a good investment for local communities. They believe that, "we do not need to choose between a healthy economy and healthy landscapes" (Chelan-Douglas Land Trust website). As part of this effort, the Land Trust partners with several local organizations to present workshops on various topics ranging from the economy to the environment. Recent workshops cover noxious weeds, sustainable landscaping and insects.

- *Conservation Roundtable, Ag and Environment Dialog, Environmental Film Series*

  The Land Trust works closely with a wide variety of landowners, conservation groups, farmers, and resource agencies to develop innovative approaches to natural resource management. The Conservation Roundtable seeks to facilitate communication and collaboration among conservation groups. This dialog fosters understanding and collaboration among farmers, agriculture groups, and environmental groups to promote

sustainable, productive, and profitable farms in the region. The Land Trust sponsors a monthly environmental film series (Chelan-Douglas Land Trust website).

The Land Trust is able to work quickly and creatively with local citizens, helping to preserve the unique character of the region and enhance the quality of life for residents, visitors, and future generations. For more details, contact the Chelan-Douglas Land Trust by e-mail: info@cdlandtrust.org or phone: (509) 667-9708.

4.14 Chelan County Public Utility District Efforts

Habitat Conservation Plan

The Chelan County Public Utility District (PUD) is collaborating with local, state, and federal governments; tribes; and private landowners to restore and protect salmon and steelhead habitat in the mid-Columbia and its tributaries. As part of the Habitat Conservation Plan (HCP) Tributary Program, the PUD funds projects to help protect and enhance salmon and steelhead spawning, rearing and migration. These projects will help the PUD meet its HCP commitment of "no-net-impact" to migrating fish. One such project includes the acclimation and rearing of summer steelhead on Blackbird Island in Leavenworth. The PUD, as part of its mitigation responsibility for the Wenatchee River basin, will rear summer steelhead in the Blackbird Island fish pond each spring, beginning in 2009 (D. Davies, e-mail correspondence, March 9, 2009). Additional information about steelhead acclimation on Blackbird Island is found in the Trout Unlimited section below (Section 4.15).

Potential PUD projects may include bank and shoreline restoration, removal of migration barriers, enhancing stream flows, native riparian plantings, wetland restoration, constructing in-stream habitat structures, acquiring conservation easements or other means to preserve critical floodplain properties, and reconnecting relic side channels to provide rearing habitat (CCPUD website). Any individual or group can propose an HCP project through either of following two funding options. The General Salmon Habitat Program will fund projects costing $25,000 or more. The Small Projects Program is for projects costing less than $25,000 and is designed to encourage community groups working in cooperation with landowners (CCPUD website). Table 7 shows the PUD's current projects underway as part of the HCP Tributary Program.

Table 7. Chelan County PUD's HCP current project list (provided by T. Larson, CCPUD, March 11, 2009).

ROCKY REACH PLAN SPECIES ACCOUNT	Project Small/GSF	Sponsor	Total Projected Cost	Trib Contribution	Project Status
Entiat Instream Structure Engineering	GSF	Cascadia Conservation District	$59,340.00	$59,340.00	in progress
LWD/Rootwad Acquisition & Transport	Small	Cascadia Conservation District	$24,600.00	$24,600.00	in progress
Entiat Canal Log Boom Installation	Small	Cascadia Conservation District	$10,660.00	$7,160.00	in progress
Below the Bridge	GSF	Cascadia Conservation District	$398,998.00	$150,000.00	in progress
Rocky Reach Total			**$94,600.00**	**$91,100.00**	
ROCK ISLAND PLAN SPECIES ACCOUNT	**Project Small/GSF**	**Sponsor**	**Total Projected Cost**	**Trib Contribution**	**Project Status**
WRIA's 45/46 Riparian Restoration	Small	Cascadia Conservation District	$50,000.00	$25,000.00	in progress
Entiat PUD Canal System Conversion	GSF	Cascadia Conservation District	$631,584.00	$99,360.00	in progress
Roaring Creek Flow Enhancement	GSF	Cascadia Conservation District	$147,000.00	$25,000.00	in progress
Keystone Canyon Habitat Restoration	GSF	Cascadia Conservation District	$193,805.00	$29,100.00	in progress
Cashmere Pond Off-Channel Habitat Project	GSF	Chelan County Natural Resources	$914,076.00	$249,110.00	in progress
Rock Island Total			**$1,936,465.00**	**$427,570.00**	

The PUD has a new 43-year license for continued operation of the Rocky Reach Hydroelectric Project (issued on February 19, 2009). The new license is based on a settlement agreement submitted to the Federal Energy Regulatory Commission (FERC) on March 17, 2006, between PUD and stakeholders that includes the local communities, state and federal agencies, tribes, and environmental groups. The new license contains requirements for operating the 1,300-megawatt project that are estimated to cost the PUD approximately $425 million over the 43 years, including continuation of the HCP for salmon and steelhead, maintaining existing parks on the Rocky Reach reservoir, providing renovation of Entiat Park, and enhancements to Lincoln Rock and Daroga State Parks. In addition, the new license has provisions to ensure safe passage of bull trout and lamprey past the dam, research on possible hatchery facilities to supplement the white sturgeon population, an evaluation of resident fish for future recreational fishing, funding for habitat restoration projects on federal and state wildlife lands, and a variety of other actions. (The above information is directly from the CCPUD website).

FERC Licensing

Aside from HCP projects, the PUD is working on three additional efforts as part of the requirements for their FERC relicensing (T. Larson, e-mail communication, March 11, 2009), including the:

1. Dryden off-channel enhancement project (side channel in the Wenatchee River),

2. Chelan River projects: Reach 4 and tailrace habitat enhancement, Low level outlet, and Pump Station, and the

3. Lake Chelan tributary barriers removal and restoration.

For more information about the above projects, contact Jeff Osborn at jeff.osborn@chelanpud.org

Expanding on the above, the PUD has restored a historic Wenatchee River side-channel as off-channel refuge and rearing habitat for salmonids. Located near Dryden, the groundwater-fed channel was enhanced (into pool/riffle habitat with large woody debris) and now provides spawning and rearing habitat. Monitoring reports have identified juvenile Chinook and Coho salmon and steelhead rearing, and adult Coho salmon spawning in the enhanced channel (J. Osborn, personal communication, March 17, 2009). Continued monitoring of the site will include electrofishing and snorkel surveys and the collection of temperature data (J. Osborn, personal communication, March 17, 2009).

The PUD has begun an extensive recovery effort that includes year-round discharge at the Chelan Dam and stream restoration along the Chelan River's lowest reach (Reach 4), near the dam's powerhouse (in the town of Chelan Falls). Year-round flow (minimum 80cfs) will be restored to the Chelan River via a new low-level outlet structure, allowing continuous flow, even when the lake level is below the 1087-foot Chelan Dam elevation (J. Osborn, personal communication, March 17, 2009). With this low-level outlet structure, flow will be provided to the river down to the lakes lowest elevation of 1079 feet (J. Osborn, personal communication, March 17, 2009).

The Reach 4 enhancement includes construction of a new side channel, along the river's right bank. LWD and gravels will be added instream to provide fish refugia and spawning areas, and develop pool/riffle habitats ideal for refuge during the spring high flows (4,000-6,000 cfs) and overwintering habitat for juvenile salmonids. A pump station will also be constructed to pump water from the tailrace upstream into this new side channel, in addition to the guaranteed minimum 80 cfs year-round flow, to provide additional spawning and rearing habitat (J. Osborn, personal communication, March 17, 2009). Native vegetative cover along the new side channel will be improved, adding habitat complexity and contributing to LWD and residual fish recruitment. Additionally, approximately 1.75 acres of new spawning habitat for Chinook salmon and steelhead has been created in the tailrace. Appropriate sized gravel was placed instream during the summer of 2008, and were used heavily by salmon during the fall spawning period. Monitoring and evaluation of this restoration project and future opportunities will continue. Restoration attention could be focused on the section of the Chelan River downstream of City limits in the 3.9 miles (6.3 km) of steep, rocky gorge downstream of the Chelan Dam.

The PUD has identified various migration barriers (depth, velocity, gradient) for Westslope cutthroat to Lake Chelan tributary streams in the Lucerne basin. Site reconnaissance and site-specific restoration plans are currently being developed

for removing these remote alluvial barriers and restoring upstream passage for adult spring spawning cutthroat trout. The PUD plans to start on-the-ground restoration in 2011, addressing two tributaries per year over a five-year period.

Other Projects

The Chelan Wildlife Area currently consists of approximately 32,540 acres of WDFW-owned and -managed lands (WDFW website). Primarily in eastern Chelan County, subunits of the Wildlife Area include the Chelan Butte, Entiat, Swakane and White River subunits. The PUD provided WDFW with funding to purchase 20,397 acres within the Chelan Butte, Entiat, and Swakane subunits (J. Osborn, personal communication, March 17, 2009). These lands have been impacted by past land uses; therefore, the PUD will be restoring 1,400 acres of the Wildlife Area as shrub steppe habitat for the bighorn sheep, mule deer, upland game birds, and numerous other wildlife species that inhabit the area (J. Osborn, personal communication, March 17, 2009). These restored lands may also be utilized for recreation by the community.

The PUD also develops and maintains a number of parks within the County. Several of these parks include boat launches, short-term boat moorage, parking, extensive day use facilities, overnight camping, picnic shelters, restrooms, showers, shoreline trails, tennis courts, playground equipment, and swimming areas. More information about Chelan County PUD habitat and restoration projects can be found online at http://www.chelanpud.org/habitat-restoration-protection.html.

Education and Outreach

The PUD offers public tours of the Rocky Reach Hydroelectric Project that begin at the Rocky Reach Visitor Center. These tours include detail about the PUD's fish recovery efforts throughout the Columbia River basin in addition to the dams fish bypass system, assorted hatchery projects and restoration/mitigation projects.

4.15 Trout Unlimited Efforts

The mission of the Washington Council of Trout Unlimited and the Icicle Chapter is to, ""CONSERVE, PROTECT AND RESTORE" cold water fisheries, their watersheds and ecosystems, as a means of maintaining our quality of life!" Trout Unlimited has been on the forefront of fisheries restoration work at the local, state and national levels. Their website explains that they remain committed to applying "the very best information and thinking available" to conservation work and have developed cutting-edge tools to help direct efforts toward those fish populations most in need of protection or restoration.

Trout Unlimited's Icicle chapter, with backing from the City of Leavenworth, is attempting to restore a fish pond on Blackbird Island to make it suitable for raising 53,000 steelhead per year in cooperation with the Chelan County PUD. Trout Unlimited acquired water rights which will allow constant stream flow into the pond from the Wenatchee River via inlet/outlet structures installed in October of 2008. The goal is to acclimate (imprint) steelhead, beginning in March 2009, on Wenatchee River water in hopes of having returning adults and potentially a Wenatchee River steelhead fishery in years to come. The steelhead are scheduled to be volitionally released beginning in May 2009 (D. Davies, e-mail correspondence, March 9, 2009). The pond will be stocked with cutthroat trout and will open to children for recreational fishing in the summer months after the all steelhead have emigrated. Additional information can be found online at http://icicletrout.org.

4.16 United States Fish and Wildlife Service Efforts

Restoration

The USFWS has been involved in numerous restoration projects and activities in Chelan County. Currently the USFWS is involved in the implementation of habitat restoration projects associated with the Entiat and Wenatchee Watershed Planning Units, Integrated Status and Effectiveness Monitoring Project (ISEMP), CCNRD, CCD, and the Yakama Nation. The USFWS actively participates on several interdisciplinary teams that work towards Entiat and Wenatchee watershed restoration efforts including: the Upper Columbia Regional Technical Team (RTT), Upper Columbia Salmon Recovery Board, the Mid-Columbia HCP Tributary Sub-Committee and the Priest Rapids Coordinating Committee's Habitat Sub-Committee. The USFWS also provides funding for restoration activities through the Western Native Trout Initiative, the National Fish Passage Program (NFPP), Partners for Fish and Wildlife and the Fisheries Restoration and Irrigation Mitigation Program. More information about the USFWS involvement in these programs can be found online at http://www.fws.gov/pacific/Fisheries/sp_habcon/index.html.

The USFWS acts as an active partner in several stream and riparian restoration efforts along the lower 26 river miles of the Entiat River. In Chelan County, the USFWS is the lead agency on three extensive projects in the Entiat and Wenatchee basins. These projects are summarized below.

- *Entiat River Restoration*
  Currently in design phase, the USFWS's Entiat National Fish Hatchery (NFH) is updating hatchery facilities and undertaking a stream enhancement project on the adjacent Entiat River (located at approximately RM 7). The project hopes to improve juvenile rearing habitat (especially during high flow events), increase instream LWD retention, increase stream

habitat complexity and off-channel refugia, and improve floodplain connectivity. The hatchery water intake system will be redesigned and will encompass a fish-friendly screen to prevent fish entrapment. There will also be a new public fishing pond (for Kids Fishing Day events) built to facilitate recreation and learning opportunities within the Entiat basin (R. Parrish, personal communication, February 25, 2009).

- *Icicle Creek Restoration*

In 2006, the BOR and the USFWS convened a Project Alternative and Solution Study (PASS) to sequentially evaluate habitat restoration and water intake for the Leavenworth NFH. Goals for this project are to: improve fish passage and stream habitat; improve management and conservation efforts for water use by the irrigation district, Leavenworth NFH and Sleeping Lady Resort; and increase fish survival and spawning success in Icicle Creek. A group of policy and technical representatives from the USFWS, BOR, other federal and state resource agencies, the Yakama Nation, and the Wild Fish Conservancy were all invited to contribute staff to a technical team. Beginning in October 2006, the technical team collaborated and developed a preferred alternative design for the new Leavenworth NFH water intake system, which was approved for implementation by the USFWS and the BOR in November 2007. Final approval for the project is still pending due to the required completion of NEPA, various permits, and related actions. The BOR has set-aside several million dollars for implementation of this alternative and it is estimated that construction of a new water intake system will begin in 2009-2010.

In February 2008, the PASS effort shifted focus towards habitat restoration within the historic channel of Icicle Creek (adjacent to Leavenworth NFH). Restoration will include the construction of roughened fish passage channel and restoration of a normative flow regime. Additional habitat improvements may include LWD placement and native riparian plantings. The BOR has budgeted funds for PASS meetings, facilitation, engineering design, and related efforts during FY 2009 in support of the technical team's goal of finalizing plans for the restoration project as soon as possible. Once the project plan is finalized and approved, the USFWS will re-initiate and complete consultation on implementation of the plan and Leavenworth NFH operations, in addition to completing NEPA compliance procedures prior to initiating construction of this project. (The above information was provided via e-mail communication with Jim Craig, USFWS Mid-Columbia FRO, March 10, 2009).

- *Chumstick Passage Barrier Removal*

The USFWS and the CCNRD are working with local land owners to remove 17 fish passage barriers along Chumstick Creek. Approximately 20 miles of

instream habitat will be restored to steelhead, spring Chinook and reintroduced Coho salmon with the removal of barriers on Chumstick Creek (including the North Road). This project is possible with funding from Bonneville Power Administration (BPA) and the National Fish Passage Program (NFPP). (The above information was provided via e-mail communication with Jim Craig, USFWS Mid-Columbia FRO, March 10, 2009).

Education and Outreach

The USFWS's Mid-Columbia FRO is also a lead and partner in several education and outreach programs throughout the County. They inform the public about local restoration efforts, while providing environmental education to the community. The FRO, in cooperation with other agencies, sends out an annual newsletter informing the Entiat community about local watershed projects. The USFWS is involved in several educational events at both the Entiat and Leavenworth NFHs including: National Fishing Week events, Salmon in the Classroom, Wanapum Archeology Days, in addition to field and classroom events and those listed below.

- *Kids in the Creek*
  The USFWS partners with the CCD on this program, described in detail in CCD section above.

- *Wenatchee River Salmon Festival*
  The USFWS is one of the lead entities that host the *Wenatchee River Salmon Festival* each year at the Leavenworth National Fish Hatchery. The CCD is one of the festival sponsors. Detail about the festival can be found in section 4.8 above.

For more information about the USFWS's programs and/or reports, contact the Mid-Columbia Fisheries Resource Office (FRO) in Leavenworth at (509) 548-7573 or look online at http://www.fws.gov/midcolumbiariverfro.

4.17 United States Forest Service Efforts

Restoration

The USFS is responsible for vegetation/fuel and road management and is an active participant in watershed-level restoration efforts throughout Chelan County. The Leavenworth Ranger District may assist in watershed planning efforts in addition to the research and monitoring programs for fish and wildlife species of the watershed, including participation in the ISEMP. Within the Entiat basin, the USFS provides technical assistance to lead entities involved in in-stream and riparian restoration projects (P. Archibald, personal communication, February 26, 2009).

Education and Outreach

The USFS is implementing its *Respect the River* program that educates recreational users about riparian protection, managing and restoring riparian vegetation, reducing stream bank erosion, and improving floodplain water storage (Chelan County Conservation District 2006).

4.19 Yakama Nation Efforts

Yakama Nation projects throughout the mid- and upper-Columbia's ceded lands follow the tribes mission, "to preserve, protect, enhance, and restore culturally important fish populations and their habitats throughout the Zone of Influence of the Yakama Nation and to protect the rights of Yakama Nation members to utilize these resources as reserved for them in the Treaty of 1855." The Entiat and Wenatchee basins are areas in Chelan County that the Yakama Nation hopes to "demonstrate the fishery benefits of integrated land and water management practices" (Yakama Nation website). Currently the Yakama Nation is involved in an instream habitat enhancement project along the lower Entiat River's keystone reach (B. Rogers, e-mail correspondence, February 19, 2009).

The Yakama Nation's Mid-Columbia Field Station (located in Peshastin) has lead restoration efforts that have successful returned extirpated Coho salmon to the Wenatchee basin. Restoration efforts are focused on upper Wenatchee River tributaries, with rearing at the Leavenworth NFH and naturalized acclimation ponds along Nason Creek. The Yakama Nation also participates in numerous salmon recovery and watershed planning efforts, in addition to the research and monitoring programs for fish species of the watershed, including participation in the ISEMP.

Please see the following website for more information about the Yakama Nation Fisheries program: http://host119.yakama.com

5. LIST OF ADDITIONAL PROJECTS AND PROGRAMS TO ACHIEVE LOCAL RESTORATION GOALS

5.1 City of Cashmere

Additional restoration opportunities, not previously mentioned in WRIA and other watershed planning efforts, were identified in the *Analysis Report* (TWC and J&S 2009) as follows:

Riverside Park: Wenatchee River spring and fall discharges of 20,000 cfs or greater threaten the existing streamside canopy cover, vegetation and dike stability. Left and right bank reduction of shoreline armoring, addition of LWD, river meandering and revegetation could stabilize the stream bank and create off-channel salmonid spawning and juvenile rearing areas. Nature interpretive signs can be posted to entice the birding and naturalist communities to utilize this park. Special restoration attention to the left bank could decrease noise from U.S. Highway 2, improving the overall park and City aesthetic.

Chelan County Historical Museum and Pioneer Village: Similar Wenatchee River armor reduction, stream bank stabilization and revegetation, as mentioned above, can continue downstream of the Riverside Park to the end of Riverfront Drive (right bank) and the Chelan County Historical Museum and Pioneer Village (left bank). The Chelan County Historical Museum and Pioneer Village has wonderful restoration potential providing opportunities for public involvement and education.

Mission Creek: Seasonal floods cause considerable property damage, bank erosion and sediment loss throughout the creek. Reduce armoring and improve native vegetative cover to add habitat complexity and contribute to large woody debris recruitment. Creation of off-channel areas may minimize flooding and provide salmonid spawning and juvenile rearing areas. A combination of native revegetation and bioengineering techniques could be provided to secure the bank from excessive erosion.

General: At an October 2008 public meeting, a number of attendees commented that several sections of the Wenatchee River and Mission Creek contain debris (old tractors, large metal pieces, household appliances etc…) that could be removed to improve stream and fish habitat, and City aesthetics.

5.2 City of Chelan

Additional restoration opportunities, not previously mentioned in WRIA and other watershed planning efforts, were identified in the *Analysis Report* (TWC and J&S 2009) as follows:

Riverwalk Park: Coordinate with the PUD to reduce shoreline armoring, improve streambank stabilization, remove non-native plantings, and add native vegetation and LWD.

City of Chelan Parks (Don Morse and Lakeside Parks): Reduce shoreline armoring, create a shoreline buffer that includes non-native vegetation, and improve shoreline stabilization. Don Morse Park is currently in the design process for updated facilities, including a substantial restoration component.

General: Many residential shoreline properties throughout the City's Lake Chelan shoreline have the potential for improvement of ecological functions through: 1) reduction or modification of shoreline armoring, 2) reduction of overwater cover and in-water structures (grated pier decking, pier size reduction, pile size and quantity reduction, moorage cover removal), 3) improvements to nearshore native vegetative cover, and/or 4) reductions in impervious surface coverage. A combination of native revegetation and bioengineering techniques could be provided to secure the shoreline from excessive erosion. Where opportunities for on-site mitigation and restoration are not available, projects could explore and consider opportunities for enhancing any of the water-conveyance swales that enter Lake Chelan and drain areas developed for orchard, vineyard, or other uses. Enhancements of these corridors would improve wildlife habitat and increase the ability of these vegetated pathways to filter and treat pollutants originating from upslope uses.

5.3 City of Entiat

Additional restoration opportunities, not previously mentioned in WRIA and other watershed planning efforts, were identified in the *Analysis Report* (TWC and J&S 2009) as follows:

Waterfront Master Plan: Implementation of the City's Waterfront Master Plan (2009c) is expected to result in substantial improvements to shoreline function. The City has worked to balance environmental restoration of the Columbia River waterfront with development of uses that are water-oriented and provide economic return to the community.

Entiat City Park/Silico Saska Park: Create a shoreline buffer, improve shoreline stabilization, remove non-native plantings and add native vegetation. Nature interpretive signs can be posted to entice the birding and naturalist communities to utilize this park.

General: Residential shoreline properties on the Columbia River have the potential for improvement of ecological functions through: 1) reduction or modification of shoreline armoring, 2) reduction of overwater cover and in-water structures (grated pier decking, pier size reduction, pile size and quantity reduction, moorage cover removal), 3) improvements to nearshore native vegetative cover, and/or 4) reductions in impervious surface coverage. A combination of native revegetation and bioengineering techniques could be provided to secure the shoreline from excessive erosion.

5.4 City of Leavenworth

An additional restoration opportunity, not previously mentioned in WRIA and other watershed planning efforts were identified in the *Analysis Report* (TWC and J&S 2009) as follows:

Blackbird Island: The City should continue to remain involved in stream bank stabilization and native vegetation establishment efforts. According to the City, the southwest tip of Blackbird Island has eroded 40 feet in 10 years. This site may be a good candidate for shoreline stabilization using bioengineering techniques. A combination of native revegetation and bioengineering techniques could be provided to secure the streambank from excessive erosion, such as was caused by the November 2006 high water event. Design of any stabilization would need to consider the high velocities in the mainstem Wenatchee River and safety issues related to high use of this section of river by non-motorized boaters and recreationists. Interpretive signs could also be updated to provide relevant information about the Wenatchee River, its biological value, and it's potential.

5.5 City of Wenatchee

Additional restoration opportunities, not previously mentioned in WRIA and other watershed planning efforts, were identified in the *Analysis Report* (TWC and J&S 2009) as follows:

Wenatchee Parks (Riverfront and Confluence State Parks): Reduction of shoreline armoring, removal of non-native vegetation, native revegetation, shoreline stabilization, and the addition of interpretive nature and/or historical signs. Enhance and maintain the habitat along the south Confluence State Park wetland area.

General: Reduce shoreline armoring, improve shoreline stabilization, and remove non-native plantings. A combination of native revegetation and bioengineering techniques could be provided to secure the shoreline from excessive erosion.

6. PROPOSED IMPLEMENTATION TARGETS AND MONITORING METHODS

As previously noted, the shoreline areas in Chelan County occupy industrial, commercial, agricultural, multi- and single-family residences, and public recreation/open space areas. Therefore, efforts should be made to improve and retain shoreline ecological function through the promotion of restoration and healthy practices at all levels, from large-scale industrial users to single-family

property owners. Chelan County and the Cities of Cashmere, Chelan, Entiat, Leavenworth and Wenatchee already have very active environment-focused communities with a strong restoration and education focus. Continued improvement of shoreline ecological functions along the many shorelines requires a comprehensive watershed approach, which combines all planning and implementation efforts.

The following table outlines possible schedules and funding sources for implementation of a variety of efforts that could improve shoreline ecological function, and are described in previous sections of this report.

Table 8. Implementation Schedule and Funding for Restoration Projects, Programs and Plans.

Restoration Project/Program	Schedule	Funding Source or Commitment
4.1 WRIA 40a/b Participation	WRIA 40a Watershed Plan: 1) Development of Phase 4 - DIP is ongoing 2) Implementation of goals for water quality and quantity improvements are ongoing	1) The WRIA 40a DIP is currently being developed, with opportunities and feasibility to be evaluated. 2) Water quality and quantity implementation goals were ranked according to their level of importance (in Appendix D and E respectively of the WRIA 40a Watershed Plan) and will be implemented as funds become available.
4.2 WRIA 45 Participation	WRIA 45 DIP: 1) Implementation is ongoing	1) Implementation goals identified in the WRIA 45 DIP are being completed in addition to salmon recovery and water quality actions that have evolved since the DIP was adopted. Funding entities have been identified in the DIP and will be addressed as funds become available.
4.3 WRIA 46 Participation	WRIA 46 DIP: 1) Implementation is ongoing	1) Implementation goals and ongoing/long-term projects identified in Table 8 of the WRIA 46 DIP in progress. Funding entities have been identified in the DIP and will be addressed as funds become available.
4.4 WRIA 47 Participation	1) WRIA 47 Final Draft Unit Charter: ongoing 2) Lake Chelan Subbasin Plan: implementation is ongoing	1) Water quantity and quality tasks have been completed, but further recommendations have been made for additional investigation. These recommendations may be implemented as funds are available. 2) Restoration opportunities identified in the plan are underway in addition to ongoing research, monitoring and evaluation. Responsible entities and anticipated funding sources have

Restoration Project/Program	Schedule	Funding Source or Commitment
		been identified in the plan. Many of these entities include: USFS, CCPUD, DNR, WDFW or the Lake Chelan Sportsman's Association.
4.5 Chelan County Department of Natural Resources	Ongoing	Continue with implementation of actions as guided by the UCSRB Implementation Plan, the Wenatchee River CMZ study and watershed plans and DIP's (listed above) as funding and grant money is available.
4.6 Comprehensive Plan Policies	1) Chelan County (amended 2005) 2) City of Cashmere (amended 2008) 3) City of Chelan (amended 2007) 4) City of Entiat (amended 2007) 5) City of Leavenworth (amended 2003) 6) City of Wenatchee (amended 2008)	The county and cities make substantial staff time commitments in the course of project and program reviews to determine consistency and compliance with the recently updated comprehensive plans.
4.7 Critical Areas Regulations	1) Chelan County (amended 2005) 2) City of Cashmere (amended 2008) 3) City of Chelan (amended 2007) 4) City of Entiat (amended 2007) 5) City of Leavenworth (amended 2003) 6) City of Wenatchee (amended 2008)	The county and cities make substantial staff time commitments in the course of project and program reviews to determine consistency and compliance with the recently updated critical areas regulations.
4.8 Stormwater Management and Planning	Ongoing	Drainage systems will be updated as new development occurs. The County/Cities make substantial staff time commitments in the course of multi-agency drainage studies, management and planning efforts.
4.9 Public Education	Ongoing	Education is identified as essential to the region in several park/recreation and comprehensive plans. County/City staff time and materials are provided in developing and planning for public education and outreach opportunities.
4.10 City Efforts	Restoration and Education/Outreach projects: Ongoing - as funds and opportunities allow	Staff time, materials and assorted funds support these efforts, in addition to the project specific partners and grant/funding arrangements. Examples follow: City of Entiat The Entiat River Outdoor Learning

Restoration Project/Program	Schedule	Funding Source or Commitment
		Center is a multi-jurisdictional effort that is funded through in-kind resources from the participants, including the City, and it is also expected that funding will be secured through state grant programs and CCPUD re-licensing funds. City of Wenatchee The Wenatchee Waterfront Sub-Area Plan is primarily funded by the City, CCPUD and private land owners.
4.11 Audubon Society Efforts	Ongoing	NCW Audubon will continue to contribute and partner in planning efforts and education/outreach opportunities as funding and volunteer time allows.
4.12 Cascadia Conservation District Efforts	Ongoing	The CCD will continue to lead, contribute and partner in planning efforts, project implementation, and education/outreach opportunities as state and grant funding allows.
4.13 Chelan-Douglas Land Trust Efforts	Ongoing	The Land Trust will continue to lead land protection efforts and contribute and partner in planning efforts, project implementation, and education/outreach opportunities as state and grant funding allows.
4.14 Chelan County Public Utilities District Efforts	Ongoing	CCPUD is committed to achieving goals and opportunities identified in the HCP tributary program in addition to projects required as part of their FERC relicensing. CCPUD will continue to support community education and park/recreation opportunities.
4.15 Trout Unlimited Efforts	Ongoing	Trout Unlimited will continue to lead and partner in fish protection and conservation efforts throughout the region as funding and volunteerism allows.
4.16 United States Fish and Wildlife Service Efforts	Ongoing	The USFWS will continue to lead and partner in restoration, conservation and education/outreach opportunities throughout the region. Project specific funding sources may vary over time.
4.17 United States Forest Service Efforts	Ongoing – limited projects	Staff time, materials and assorted funds may be available to support restoration, research, monitoring and education/outreach opportunities and partnerships.
4.18 Yakama Nation Efforts	Ongoing	Staff time, materials and assorted funds may be available to support watershed planning, restoration, research, and monitoring opportunities and partnerships. The Yakama Nation may

Restoration Project/Program	Schedule	Funding Source or Commitment
		act as a project specific lead or partner and may provide varying grant/funding sources over time.

County and City planning staff will track all land use and development activity, including exemptions, within their respective shoreline jurisdictions, and will incorporate actions and programs of other departments as well. Reports will be assembled by each jurisdiction that provides basic project information, including location, permit type issued, project description, impacts, mitigation (if any), and monitoring outcomes as appropriate. Examples of data categories might include square feet of non-native vegetation removed, square feet of native vegetation planted or maintained, reductions in chemical usage to maintain turf, linear feet of eroding stream bank stabilized through plantings, linear feet of shoreline armoring removed or modified levees, changes to square footage of over-water cover, or number of fish passage barriers corrected.

The report would also recommend or describe relevant updates to WRIA, County and City goals and implementation plans, and outline current and ongoing implementation of various programs and restoration actions (by local government or other groups) that relate to watershed health.

The staff reports will be assembled to coincide with Comprehensive Plan updates and will be used, in light of the goals and objectives of the Shoreline Master Program, to determine whether implementation of the SMPs is meeting the basic goal of no net loss of ecological functions relative to the baseline condition established in the *Analysis Report* (TWC and J&S 2009). In the long term, each local government should be able to demonstrate a net improvement in their respective shoreline environments.

Based on the results of these assessments, each local government may make recommendations for changes to its SMP.

7. RESTORATION PRIORITIES

This restoration plan, a phase of the Shoreline Master Program update process (consistent with WAC 173-26-201(2)(f)), includes "goals, policies and actions for restoration of impaired shoreline ecological functions." Restoration opportunities have been "designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program." This Restoration Plan demonstrates how specific potential projects match and meet regional or County/City-wide goals and objectives of the region,

watershed planning entities, and environmental organizations that contribute or could potentially contribute to improved ecological functions of the shoreline. Prioritization of specific projects and project types, implementation strategies, and schedules will be based on information found in watershed or basin plans.

The process of prioritizing actions that are geared toward restoration of the County/City shoreline areas involves balancing ecological goals with a variety of site-specific constraints. Briefly restated, the County/City environmental protection and restoration goals include 1) protecting watershed processes, water quality and quantity; 2) protecting open/recreational space and the habitats for fish and wildlife; and 3) contributing to ESA listed spring Chinook and steelhead conservation and recovery efforts. Constraints that are specific to Chelan County and the Cites of Cashmere, Chelan, Entiat, Leavenworth and Wenatchee include 1) the community's diverse past and present land uses and desires (that includes livestock grazing, orchards, and logging), 2) rivers and streams that have been confined by roads or that have altered flow regimes from the construction of dams and/or irrigation diversions, and 3) the highly developed and armored shorelines along Lake Chelan in the City of Chelan and the Columbia/Wenatchee Rivers near the City of Wenatchee. While much of the County lands offer good ecological functions (generally the upper basins and forest/wild lands of each drainage), opportunities have been recognized to further enhance ecological functions, conservation and education of these shorelands. Goals and constraints were used or will be used in the various watershed plans and implementation plans to develop shoreline restoration actions and a ranking prioritization of projects, programs, or sub-basins specific to each WRIA.

Although restoration project/program scheduling has been suggested and summarized in each watershed and entity planning effort identified in Chapters 3 and 4, the actual order of implementation may not always correspond with the priority level assigned to that project/program. This discrepancy is caused by a variety of obstacles that interfere with efforts to implement projects in the exact order of their perceived priority. Some projects, such as those associated with riparian planting, are *relatively* inexpensive and easy to permit and should be implemented over the short and intermediate term despite the perception of lower priority than projects involving extensive shoreline restoration or large-scale capital improvement projects. Projects with available funding will be initiated immediately for the worthwhile benefits they provide and to preserve a sense of momentum while permitting, design, site access authorization, and funding for the larger, more complicated, and more expensive projects are under way.

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9. LIST OF ACRONYMS AND ABBREVIATIONS

BLM ..... U.S. Bureau of Land Management

BOCC..... Board of County Commissioners

BOR..... Bureau of Reclamation

CCCD ..... Chelan County Conservation District

CCD ..... Cascadia Conservation District

CCNRD ..... Chelan County Natural Resource Department

CCPUD..... Chelan County Public Utilities District

CDLT ..... Chelan Douglas Land Trust

cfs ..... cubic feet per second

CMZ..... channel migration zone

DIP ..... Detailed Implementation Plan

DPS ..... Distinct Population Segment

ESA ..... Endangered Species Act

ESU ..... Evolutionarily Significant Unit

EWPU ..... Entiat Watershed Planning Unit

FEMA ..... Federal Emergency Management Agency

FERC..... Federal Energy Regulatory Commission

FRO..... Fisheries Resource Office

FWHCA ..... Fish and Wildlife Habitat Conservation Area

GIS ..... Geographic information systems

HFEP..... Habitat Farming Enterprise Program

IRIS ..... Initiative for Rural Innovation and Stewardship

ISEMP ..... Integrated Status and Effectiveness Monitoring Project

LWD ..... Large Woody Debris

NEPA..... National Environmental Policy Act

NFH ..... National Fish Hatchery

NOAA Fisheries..... National Marine Fisheries Service

NPDES..... National Pollutant Discharge Elimination System

NPS ..... National Park Service

NRCS ..... Natural Resources Conservation Service

OHW/M ..... ordinary high water/mark

PUD ..... Public Utility District

RCW ..... Revised Code of Washington

SMA ..... Shoreline Management Act

SMP..... Shoreline Master Program

UCRTT ..... Upper Columbia Regional Technical Team

UCSRB..... Upper Columbia Salmon Recovery Board

UGA..... Urban Growth Area

USFS ..... United States Forest Service

USFWS ..... U.S. Fish and Wildlife Service

WAC ..... Washington Administrative Code

WDFW..... Washington Department of Fish and Wildlife

WDNR..... Washington Department of Natural Resources

WRIA..... Watershed Resource Inventory Area

WWMP..... Wenatchee Watershed Management Plan

WWPU ..... Wenatchee Watershed Planning Unit