

SHORELINE RESTORATION PLAN

FOR SHORELINES IN KLICKITAT COUNTY

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SHORELINE RESTORATION PLAN

FOR SHORELINES IN KLICKITAT COUNTY

1 INTRODUCTION

The Klickitat County Shoreline Restoration Plan (Restoration Plan) is a required **non-regulatory** component of the Shoreline Master Program (SMP) update. The Restoration Plan is intended to plan for “overall improvements in shoreline ecological function over time, when compared to the status upon adoption of the master program” (WAC 173-26-201(2)(f)). The Restoration Plan represents a vision for **voluntary** restoration to be implemented over time and result in ongoing improvement to shoreline ecological function within Klickitat County.

The Restoration Plan draws on a variety of previous and current planning efforts to identify possible restoration priorities, strategies, and projects; key partners in implementing shoreline restoration; and potential funding opportunities.

1.1 Purpose

The primary purpose of this document is to plan for improvements to shoreline functions and processes.

Secondarily, the Restoration Plan may also ensure that the minimum requirement of no net loss of shoreline ecological function is achieved on a County-wide basis, regardless of any shortcomings of individual projects or activities. By law, activities that have adverse effects on the ecological functions of the shoreline must be mitigated (WAC 173-26-201(2)(e)). Proponents of such activities are *individually* required to mitigate such adverse effects to pre-activity (i.e. baseline) conditions. However, many shoreline impacts that may be sufficiently minor on an individual level become significant when considered cumulatively. Additionally, unregulated activities, such as operation and maintenance of existing developments, may also degrade baseline conditions. Finally, while the SMP applies only to activities within shoreline jurisdiction, upland or upstream activities beyond jurisdictional boundaries may have offsite impacts on shoreline functions. Without restoration and protection measures to offset them, these impacts can result in cumulative, incremental, and unavoidable degradation of the overall baseline condition. Accordingly, the Restoration Plan serves as a guide for ecological restoration and protection activities implemented voluntarily by the County and other government agencies, developers, non-profit groups, and property owners within shoreline jurisdiction. Taken together,

these activities must ensure no net loss of ecological function, and where possible may lead to improvement of overall shoreline ecological function.

1.2 Contents of this Restoration Plan

This Restoration Plan has been prepared to meet the purposes defined above, as well as specific requirements of the SMP Guidelines (Guidelines). WAC Section 173-26-201(2)(f) of the Guidelines requires that Restoration Plans:

1. Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;
2. Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;
3. Identify existing and ongoing projects and programs that are currently being implemented, or are reasonably assured of being implemented (based on an evaluation of funding likely in the foreseeable future), which are designed to contribute to local restoration goals;
4. Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;
5. Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals; and
6. Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.

The Shoreline Analysis Report (The Watershed Company 2016) provides background information on watershed setting, key habitats and processes, existing regulatory framework, and land use conditions. In the interest of brevity, those topics are not repeated in this document.

The restoration opportunities identified in this plan are based on existing plans. Because this Restoration Plan is intended to document opportunities for improvement of shoreline ecological functions compared to the baseline condition, previously completed restoration actions are not addressed.

1.3 Uses of this Restoration Plan

In addition to meeting grant requirements, this Restoration Plan may be used by agencies, interest groups, and property owners in the following ways:

- Grant applications: Programs and projects included in this Restoration Plan may find it easier to obtain grant funding from sources that require or recommend inclusion in a publicly-vetted and adopted plan.
- Information resource: Chapter 4.1 of this Restoration Plan identifies a number of organizations that provide guidance, and in some cases funding, for a wide variety of restoration projects. Property owners or other parties wishing to undertake a restoration action may consult these organizations. Similarly, Chapter 4.2 identifies a number of funding opportunities available to support restoration and protection projects in Klickitat County.
- Mitigation: In situations that require off-site mitigation, this Restoration Plan can provide a source of programmatic or specific project ideas that maximize the regional impact of the mitigation.

Depending on the scale and type of project, property owners and interest groups wishing to conduct restoration activities may need to obtain local permits, as well as permits from the Washington State Department of Ecology (Ecology), the Washington State Department of Fish and Wildlife (WDFW), and the Washington State Department of Natural Resources (WDNR), and/or the U.S. Army Corps of Engineers (Corps). Projects within shoreline jurisdiction will also need to comply with the adopted SMP, including the critical areas regulations outlined in Appendix B. Also depending on the scale and type of project, professionals, including biologists or engineers, may need to assist in project design and implementation.

Many of the restoration opportunities identified in this Restoration Plan may apply to private property or public property. It is not the intent to require restoration on private property or commit privately owned land for restoration purposes without the willing and voluntary cooperation and participation of the affected landowner.

2 RESTORATION GOALS

The overall goal of this Restoration Plan is to improve shoreline ecological functions over time when compared to existing conditions.

The following objectives illustrate how the County and their restoration partners might work to achieve a net improvement in shoreline ecological function:

- Protect natural watershed processes and restore those processes that have been altered;

- Promote ecosystem resilience in the face of future changes; and
- Maintain biodiversity and conserve unique, fragile, and valuable species and habitats.

In addition to the overall goal and the three objectives proposed above, the following goals, excerpted from watershed planning documents, provide a common focus for restoration in the county.

For the Klickitat Lead Entity Region (White Salmon and Klickitat Rivers):

- *“Achieve long-term and continuing salmonid habitat improvements in all [Klickitat Lead Entity Region Salmon Recovery Strategy] SRS watershed areas with particular emphasis on the limiting habitat features in top tier areas of the SRS Matrix.*
- *Through easements and acquisitions, promote protection of SRS critical watershed areas to prevent degradation, both human and naturally caused.*
- *Increase salmonid spawning and rearing areas through both restoration of stream reaches and establishing or improving salmonid access.*
- *Bring salmonid populations to levels consistent with the maximum potential of each of the watersheds in the Klickitat Lead Entity area.”*

(Klickitat Lead Entity Region Salmon Recovery Strategy 2013)

For the Klickitat and White Salmon Subbasins:

- *“Protect or enhance the structural attributes, ecological function, and resiliency of habitats needed to support healthy populations of fish and wildlife.”*

(Northwest Power Planning Council (NPCC) 2004, Klickitat Subbasin Plan and White Salmon Subbasin Plan)

For the entire Columbia River Basin:

- *“The vision... is a Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, supported by mitigation across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem. This envisioned ecosystem provides abundant opportunities for tribal trust and treaty-right harvest, non-tribal harvest, and the conditions that allow for restoration of the fish and wildlife affected by the construction and operation of the hydrosystem.*

“The vision will be accomplished by protecting and restoring the natural ecological functions, habitats, and biological diversity of the Columbia River Basin. Where this is not feasible, other methods that are compatible with self-sustaining fish and wildlife populations will be used, including certain forms of

production of hatchery fish. Where impacts have irrevocably changed the ecosystem, the program will protect and enhance habitat and species assemblages compatible with the altered ecosystem.”

(Northwest Power and Conservation Council 2014)

3 SHORELINE CONDITIONS AND RESTORATION STRATEGIES

3.1 Overview

3.1.1 Context

The County recently completed a comprehensive inventory and analysis of their shorelines (The Watershed Company 2016) as a supportive element of the SMP update. The purpose of the shoreline inventory and analysis was to gain a greater understanding of the existing condition of the County’s shoreline environment to ensure the updated SMP policies and regulations will protect local ecological processes and functions. The *Shoreline Analysis Report for Shorelines in Klickitat County* (The Watershed Company 2016) (herein referred to as “Analysis Report”) describes existing physical and biological conditions in shoreline jurisdiction. A summary of the current regulatory framework is included, as well as existing shoreline conditions, an analysis of ecological functions and ecosystem-wide processes, land use, and public access. A map folio of the shoreline inventory results is also included as Appendix B of the Analysis Report.

Shoreline Jurisdiction

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 greater than 20 cubic feet per second (cfs), lakes whose area is equal to or greater than 20 acres, and all marine waters. 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)“

Based on the above definitions, the County’s shoreline jurisdiction includes the waters and associated shorelands of the 30 waterbodies indicated in Table 3-1, below.

Table 3-1. Klickitat County Shorelines of the State.

| | |
|------------------------------|---------------------------|
| Bowman Creek | Mill Creek |
| Buck Creek | Mill Pond |
| Camas Ditch and Outlet Creek | Paterson Slough |
| Cave Creek | Rattlesnake Creek |
| Chamberlain Lake | Rock Creek |
| Columbia River* | Rowland Lake |
| Dead Canyon Creek | Satus Creek** |
| Frasier Creek | Snyder Canyon Creek |
| Gilmer Creek | Summit Creek |
| Holmes Creek | Swale Creek |
| Horsethief Lake | Trout Creek |
| Klickitat River* | Trout Lake Creek* |
| Little Klickitat River | White Creek |
| Major Creek | White Salmon River* |
| Major Creek, West Fork | Little White Salmon River |

* All or portions of these waterbodies also meet criteria for Shorelines of Statewide Significance (see Shoreline Analysis Report, Section 1.2.2).

** The reach of Satus Creek which meets shoreline criteria lies entirely within the Yakama Nation and therefore is excluded from this Restoration Plan.

The majority of Klickitat County shorelines are located within Water Resource Inventory Area (WRIA) 30, the Klickitat watershed. The County also includes portions of WRIA 29 (Wind-White Salmon), WRIA 37 (Lower Yakima) and WRIA 31 (Rock Glade). The 2007 Legislature split the Wind-White Salmon watershed (WRIA 29) into two subbasins for continued planning and implementation purposes. The Wind subbasin in the western part of the basin became WRIA 29a and the White Salmon subbasin in the east, within Klickitat County, became WRIA 29b. The Columbia River system forms the southern boundary of the County. The only shoreline waterbody in WRIA 37 is Satus Creek. The reach of Satus Creek which meets shoreline criteria lies entirely within the Yakama Nation and therefore is excluded from analysis in the County’s SMP process. No shoreline waterbodies are within WRIA 31, other than the Columbia River system.

3.1.2 Types of Restoration Strategies

Consistent with Ecology’s definition, use of the word “restore” in this document is not intended to encompass actions that reestablish historic conditions. Instead, it encompasses a suite of strategies that can be approximately delineated into five categories:

- **Creation:** Establishment of new shoreline resource functions where none previously existed.
- **Re-establishment:** Restoration of a previously existing converted resource that no longer exhibits past functions.
- **Rehabilitation:** Restoration of functions that are significantly degraded.
- **Enhancement:** Improvement of functions that are somewhat degraded.
- **Preservation:** Protection of an existing high-functioning resource from potential degradation. Preservation is often achieved through conservation easements or the purchase of land.

Restoration can sometime be confused with mitigation. Mitigation is defined by WAC 197-11-768 as the sequential process of avoiding, minimizing, rectifying and reducing impacts, as well as compensating for unavoidable impacts and monitoring the impact. Two primary conditions differentiate the terms restoration and mitigation: the outcome and whether the action is voluntary or required as a result of anticipated or realized impacts. Table 3-2 describes the differences between the two terms.

Table 3-2 Characteristics of restoration versus mitigation.

| Restoration | Mitigation |
|---|--|
| Actions to reestablish or improve functions or processes above the existing baseline condition. | Actions to compensate for unavoidable negative impacts to functions or processes and return functions and processes to existing baseline condition (the condition prior to the proposed impact). |
| Voluntary | Required as a result of anticipated or realized impacts |

Although some of the projects or programs included in this Restoration Plan may be implemented as mitigation, only those projects and programs that have reliable certainty of being implemented as restoration will be utilized in the County’s cumulative impacts analysis.

The following sections highlight the shoreline conditions that were identified in the Analysis Report for each watershed and summarize the restoration strategies and actions identified by

various sources to address impairments based on watershed and regional restoration planning efforts.

3.2 WRIA 29b – White Salmon

3.2.1 Shoreline Conditions

Forestland management is the predominant land use in the White Salmon watershed. Secondary land uses include agriculture, recreation and some residential and commercial development (NPCC 2004a). Outside of the cities of White Salmon and Bingen, the area is predominantly rural. Much of the shoreline along the White Salmon and its tributaries in WRIA 29b is undeveloped. Impacts from commercial development and infrastructure improvements occur primarily in the unincorporated communities of Trout Lake, Husum, and BZ Corner. Highway 141 is the primary highway in the region and generally parallels the White Salmon River. Water quality concerns in the watershed are primarily from non-point sources throughout most of the watershed, including livestock, fertilizers, stormwater pollutants, and septic systems (Ecology 2011, Aspect Consulting 2009). Based on Ecology's 303(d) list of impaired waters, temperature is also a concern in several of the waterbodies in the watershed: Trout Lake Creek, Hole in the Ground Creek, Gotchen Creek, White Salmon River, Little White Salmon River, Gilmer Creek, Buck Creek, Rattlesnake Creek, and Major Creek. The White Salmon River is also listed as having impaired instream flow.

The Condit dam restricted access for migratory fish to the upstream reaches of the White Salmon River for 100 years. It was breached in 2011 and fully removed in 2012. Since then, migratory fish species have been re-established in the upstream reaches of the White Salmon River (Allen et al. 2016). There are several waterfalls that naturally limit the potential fish distribution in the mainstem White Salmon River and accessible tributaries. The likely end of anadromous fish distribution in the mainstem is at Big Brother Falls, north of the community of BZ Corner. Several other waterfalls downstream may be complete or partial barriers to some species including BZ Falls and Husum Falls. Tributary habitat is also limited because of high waterfalls. There are four main tributaries likely accessible to anadromous fish: Rattlesnake Creek, Spring Creek (non-shoreline), Buck Creek and Mill Creek (a non-shoreline different Mill Creek than the Klickitat River tributary) (Allen et al. 2016).

As of 2014, surveys indicate that spring and fall Chinook have generally recolonized the White Salmon River as anticipated. Steelhead have also recolonized in the mainstem and expected tributaries, but more monitoring is needed to understand the full extent. Other anadromous species observed in 2013 include coho, pink, and sockeye salmon (Allen et al. 2016).

Along the White Salmon River shoreline functions appear most impaired though Husum and just north of Husum where shorelands have been altered by agricultural and residential uses, primarily through riparian vegetation removal.

3.2.2 Restoration Strategies

The removal of the Condit Dam from the White Salmon River in 2011 made the river’s upper reaches accessible for migratory fish for the first time in 100 years. The removal created significant changes to the ecology of the river, including export of fine-grained sediment from the former Northwestern Lake above the dam. At the same time, landowners along the upper White Salmon River may now qualify for salmon-related restoration funds as habitat is opened up for anadromous salmonids above the dam (Klickitat Lead Entity 2013). In addition to broader issues of habitat and water quality, restoration strategies in the watershed address the unique opportunity afforded by the dam removal project.

Table 3-3 highlights potential restoration strategies and opportunities for the White Salmon River watershed.

Table 3-3. White Salmon River watershed restoration strategies and opportunities

| Strategy | Issue(s) | Source(s)* |
|---|---|------------|
| Geographic focus: Watershed-wide | | |
| Place LWD as appropriate; add structure to form pools. Remove man-made confinement structures and stabilize streambanks. | Low quality pools, sediment inputs, limited in-stream cover | LES |
| Add in-stream structure to trap gravels. | Lack of spawning gravel | LES |
| Restore wetlands, floodplain connectivity, and other water-holding capacity on the plateau. | Low summer flows and high peak flows | LES |
| Establish conifers in riparian areas. | High summer stream temperature, long-term pool habitat availability | LES |
| Remove or replace barriers blocking or impairing passage including dams, dikes, road culverts, and irrigation structures. | Fish passage barriers | LES |
| Increase shading along temperature-limited reaches. Restore natural riparian vegetative communities, including eradication of invasive species. | Reduced riparian function | LES |
| Relocate or improve floodplain infrastructure and roads. | Floodplain connectivity | LES |
| Geographic focus: White Salmon River | | |
| Revegetate any riparian areas that are affected by actions related to Condit Dam Mitigation. | Pool quality and quantity for rearing habitat, LWD | LES |

| Strategy | Issue(s) | Source(s)* |
|---|---|-------------------|
| Support efforts to control and/or eradicate invasive species that pose a threat to important habitat. | Alteration of native ecosystem and community dynamics | LES |
| Improve base flow by returning unused diverted water and improving irrigation efficiencies. | Low summer flows and higher stream temperatures | LES |
| Provide screening at irrigation diversions and replace screens that do not meet criteria. | Diversion of fish into unsuitable habitat | ESA |
| Improve grazing management and road drainage. | Sediment loading | LES, ESA |
| Reduce sediment inputs and reduce increases in peak flows originating from roads | Sediment loading | LES, ESA |
| Protect high quality habitat from land conversions using voluntary acquisitions and/or easements | Loss of floodplain habitat | LES, ESA |
| Geographic focus: White Salmon River – upstream of Condit Dam | | |
| Reduce nutrient runoff from agricultural lands. | Water quality (nutrients) | ESA |
| Reduce runoff from septic tanks and dairies. | Water quality (fecal coliform) | ESA |
| Reconnect side channels and off-channel habitats to stream channels, and reconnect floodplain to channel. | Floodplain connectivity and function | ESA |
| Restore wet meadows. | Floodplain connectivity and function | ESA |
| Reintroduce beaver into areas with suitable habitat. | Stream incision, hydrologic function | WSSP |
| Geographic focus: White Salmon River – downstream of Condit Dam | | |
| Restore habitat in reaches formerly occupied by Northwestern Lake and downstream of former dam site. | High fine sediment loads from former lake | WSSP |
| Use landowner incentives to conserve remaining intact pine/oak forests. | Loss of old growth or late seral forests | WSSP |
| Geographic focus: Little White Salmon River | | |
| Restore instream flows through implementation of water conservation measures, water rights closures, and acquisition of existing water rights | Low summer flows | LCSP |
| Enhance access to mineral sources via dense vegetation removal, and maintain and enhance growth of berry/mast-producing shrubs and trees | Loss of band-tailed pigeon habitat | LCSP |

* LES: Klickitat Lead Entity Region Salmon Recovery Strategy (Klickitat Lead Entity 2013)

ESA: ESA Recovery Plan for the White Salmon River Watershed (NMFS 2013)

WSSP: White Salmon Subbasin Plan (NPPC 2004a)

LCSP: Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan (LCFRB 2004)

In addition to the issue-based strategies and opportunities identified above, the Lower White Salmon National Wild and Scenic River Management Plan defines several goals, summarized below, that would contribute to improvements in ecological functions along the White Salmon River (USFS 1991b).

- Maintain or enhance levels of biological diversity which presently exist, and habitats of sensitive plant and animal species which exist in the management area.
- Prevent introduction of non-native plant or animal species that could adversely affect existing native plants and animals.

The management plan also has goals intended to minimize environmental impacts from construction of new infrastructure and operation of agriculture, forestry, recreation, and other uses.

3.3 WRIA 30 – Klickitat

3.3.1 Shoreline Conditions

The majority of WRIA 30 is forested. Historically, fire was a common disturbance in the subbasin. However, fire suppression practices have altered the fire disturbance regime, resulting in changes in vegetative species composition. The Klickitat subbasin plan notes that, “many areas that were historically dominated by fire-dependent communities have been altered through succession to more dense vegetation that is prone to catastrophic fire” (NPCC 2004b). Much of the forestland is managed for commercial timber production. Agricultural land, primarily for pasture, dry-land farming and livestock grazing is present primarily in the Outlet Creek drainage area, along the Little Klickitat River near Goldendale, and in the upper Swale Creek drainage (NPCC 2004b).

Two significant wildlife areas are present in the region: the Klickitat Wildlife Area and Conboy Lake National Wildlife Refuge. The Klickitat Wildlife Area, owned and managed by WDFW, covers approximately 14,000 acres in the western portion of the County. Most of the area borders the Klickitat River and which supports federally listed steelhead, spring Chinook and bull trout.

The Conboy Lake area provides a spring migration area for Canada geese and ducks and wintering use for tundra swans, Canada geese, ducks, and bald eagles. One of three known nesting areas for sandhill cranes in Washington is located in the refuge, as is one of two known populations of Oregon spotted frogs (NPCC 2004b).

The lower 10 miles of the Klickitat River is also designated as part of the National Wild and Scenic Rivers System under Wild and Scenic Rivers Act.

Land use-related water quality impacts generally occur as a result of forest practices, agricultural practices or residential or commercial construction. The Little Klickitat River, Swale Creek and the Klickitat River are all on Ecology's 303(d) list of impaired waters. The Little Klickitat River is impaired for dissolved oxygen, pH and bacteria; Swale Creek for dissolved oxygen, pH and temperature; and the Klickitat River for PCBs, Toxaphene, dissolved oxygen and temperature.

WDFW Salmonscape mapping shows fall and spring Chinook salmon distribution in the Klickitat River, including rearing habitat for spring Chinook and spawning habitat for both fall and spring Chinook. Fall and spring Chinook are also documented in the Little Klickitat River, Bowman Creek, Summit Creek, White Creek and Swale Creek. Spring Chinook only are documented in Trout Creek (WDFW 2016a). Bull trout are also documented in portions of the Klickitat River (WDFW 2016a). Coho salmon are documented in the Klickitat River, Snyder Creek, Little Klickitat River, Swale Creek, Summit Creek and White Creek, as well as multiple non-shoreline tributaries (WDFW 2016a).

Winter and summer steelhead are also present in WRIA 30. The Klickitat River is mapped as a spawning stream for winter steelhead from the mouth up to Summit Creek with documented presence continuing upstream and in Summit Creek. Presence is presumed in White Creek and is documented in Swale Creek, Snyder Creek, the Little Klickitat River and the lower portion of several non-shoreline tributaries. Spawning is shown in portions of Swale Creek, the Little Klickitat River and lower Bowman Creek (WDFW 2016a). There is documented summer steelhead rearing in the Klickitat River near its mouth, and spawning throughout the rest of the river in the County. There is also documented presence in the lower portion of several Klickitat River tributaries including Snyder Canyon Creek, Mill Creek, Bowman Creek, Trout Creek, White Creek, Summit Creek and Outlet Creek.

The WRIA 30 Watershed Management Plan notes that there are a number of natural migration barriers in the watershed (WPN and Aspect 2005a).

"The Klickitat River flows through a deep, steep walled canyon with historically impassable or marginally passable falls and cascades where the river flows over resistant bedrock. In addition, access to many of the tributaries is restricted because there are impassably high gradients close to the tributary mouths. The most significant natural fish passage barriers and impediments include:

Lyle Falls (River Mile (RM) 2.2) is currently not a barrier to any indigenous salmon or steelhead stocks, but passage at the falls is considered difficult. Historically the Lyle Falls was a barrier to coho salmon and possibly fall Chinook.

Castile Falls (RM 64.0) is a series of 11 falls with an elevation change of 80 feet over one-half mile. These falls are considered the historical upper limit of anadromous fish usage on the mainstem Klickitat River (Washington State Conservation Commission (WSCC), 1999). Fish passage facilities have been installed at Castile Falls.

Little Klickitat River Falls (RM 6.1) is considered passable by steelhead under some flow conditions. The frequency that the falls is passable is unknown. Larger flow events are probably required to enable passage. Long-term residents have not observed steelhead above the falls, but limited observations of redds suggest that spawning of large fish may have occurred in a high flow year. No documentation is available to determine whether the spawning fish were steelhead that passed the falls or large trout that were stocked by the trout hatchery or escaped from trout ponds (both of which have been documented through communications with residents).

West Fork Klickitat River Falls (RM 0.3 and RM 4.6) is a 15 to 20 foot falls located 0.3 miles upstream of the confluence with the mainstem of the Klickitat River. The falls is likely a passage barrier.

Tributary Falls: Numerous tributaries in the WRIA, such as Outlet Creek, Bowman Creek, Canyon Creek, and Blockhouse Creek, have falls that block passage into upstream habitats.

Results of the reach analysis in the Analysis Report note that the lower portion of Snyder Canyon Creek is one of the most heavily altered shoreline areas in the County. Shorelines have been modified by vegetation removal and impervious surfaces dominate the shorelands as a result of development associated with a previous mill operation. Much of the channel is armored and natural hydrologic, vegetative, habitat and hyporheic functions are all limited. Opportunity exists to conduct shoreline restoration activities on the County owned parcel at the confluence with the Klickitat River.

3.3.2 Restoration Strategies

Within the Klickitat Watershed, primary issues identified include loss of riparian vegetation; reduced in-stream flow; reduced in-stream habitat complexity; increase in fine sediment loading; and reduced in-stream habitat availability due to fish passage barriers. Lack of riparian shading has led to elevated water temperatures in the Little Klickitat River basin, for which the Department of Ecology (Ecology) has developed a TMDL. The TMDL also identifies reduced in-stream flow and increased sediment loading as contributing causes.

Table 3-4 highlights potential restoration strategies and opportunities for the Klickitat River watershed.

Table 3-4. Klickitat River watershed restoration strategies and opportunities

| Strategy | Issue(s) | Source(s)* |
|---|---|-------------------|
| Geographic focus: Watershed-wide | | |
| Restore or protect riparian vegetation using landowner incentives such as purchase easements or leases, or federal or state programs that promote riparian conservation. | Loss of riparian vegetation | KSP, LES, WRIA 30 |
| Reintroduce beavers and reintroduce or plant large woody debris (LWD) where appropriate. | Stream incision, loss of large woody debris | KSP |
| Continue and enhance riparian weed control efforts. | Non-native vegetation in riparian areas | KSP |
| Implement grazing and livestock management BMPs to minimize riparian disturbance. | Loss of riparian vegetation, sediment | KSP, WRIA 30 |
| Protect functioning floodplain areas, and restore floodplain connectivity by removing fill, pulling back road prism. Relocate, remove, or repair roads that impair hydrologic function. Relocate floodplain infrastructure. | Reduction in floodplain acreage, hydrological alteration, channel incisions | KSP, LES |
| Increase floodplain, reconnect side channels, and improve floodplain connectivity. | Reduced channel complexity, off-channel habitat, channel evulsion | LES, KSP |
| Restore channel roughness and increase pool frequency by placing LWD and other structures. | Low pool frequency, channel complexity, channel incision | LES |
| Remove, repair, or replace barrier culverts | Access to fish habitat | LES |
| Geographic focus: Klickitat River | | |
| Revegetate elevated gravel bars (from 1996 floods) and reestablish and/or enhance native vegetation within the floodplain. | Loss of riparian vegetation, channel evulsion | LES, KSP |
| Protect intact pine/oak forests using landowner incentives such as purchase easements or leases. | Loss of old growth or late seral forests | KSP |
| Protect remaining important wetlands and, where appropriate, restore habitat to suitable conditions. | Loss of wetlands | KSP |
| Geographic focus: Little Klickitat River | | |
| Reduce sediment erosion from uplands, including roads, grazed areas, logged areas, and other sources such as construction site, stormwater runoff, and cropland runoff | Sediment, channel morphology | TMDL |
| Restore watershed features that retain moisture in the upper portions of the watershed throughout the year, such as wetlands and naturally occurring ponds, or treed hill slopes with vegetated soil | Low summer instream flows, bank stability | TMDL |
| Increase stream connections to hyporheic zone | Low summer instream flows | TMDL |

| Strategy | Issue(s) | Source(s)* |
|---|--|------------|
| Replace antiquated bank stabilization structures with river- and neighbor-friendly bank protection methods | Bank stability | TMDL |
| Geographic focus: Swale Creek | | |
| Modify railroad bed or place structures to facilitate the capture of stream-adjacent sediments that could support riparian vegetation | Temperature | WRIA 30 |
| Protect high quality shrub-steppe habitat from land use conversion, and continue and enhance shrub-steppe weed control programs | Loss/degradation of shrub-steppe habitat | KSP |

*KSP: Klickitat Subbasin Plan (NPPC 2004b)

LES: Klickitat Lead Entity Region Salmon Recovery Strategy (Klickitat Lead Entity 2013)

WRIA 30: Klickitat Basin (WRIA 30) Watershed Management Plan (WPN & Aspect Consulting 2005)

TMDL: TMDL for Little Klickitat River (Ecology 2005)

In addition to the issue-based strategies and opportunities identified above, the Lower Klickitat River National Wild and Scenic River Management Plan defines several goals, summarized below, that would contribute to improvements in ecological functions along the Klickitat River (USFS 1991a).

- Maintain the river’s free-flowing character, with no new bridges, dams, diversion, or other instream structures for flood control or water supply.
- Maintain a non-degradation policy for water quality, and maintain adequate flow levels in the river to protect and allow for resource enhancement.
- Maintain and enhance resident and anadromous fish habitat and populations.
- Maintain the existing character of shorelands and of canyon hillsides, and reduce the potential for impacts from hillside development.
- Identify and conserve rare plants species and communities in the river corridor, and implement a program to identify and conserve significant stands of Oregon white oak.

3.4 Columbia River

3.4.1 Shoreline Conditions

The conditions along the Columbia River within shoreline jurisdiction vary from armored roadbed and railroad to industrial development, agriculture, and some open space. Generally functions are limited by armoring along much of the river that limits flow attenuation and instream habitat diversity. Multiple overwater structures are also present. Dam regulation and dredging throughout the Columbia River impact natural hydrologic processes. Functions are higher in the Lyle, Roosevelt, and Alderdale areas where armoring is more limited and more vegetated shoreline is present waterward of the railroad. Some backwater areas, wetlands, and islands allow for sediment deposition and off-channel habitat.

The railroad limits wildlife dispersal opportunities and riparian vegetation is limited along several of the reaches. However, shrub steppe vegetation and bluffs provide upland habitat value. Anadromous fish use is documented throughout the river. All 13 ESA-listed evolutionary significant units (ESUs) of salmon (*Oncorhynchus* spp.) and steelhead (*O. mykiss*) in the Columbia basin use the mainstem Columbia River for migration to and from freshwater natal areas to the Pacific Ocean (National Marine Fisheries Service (NMFS) 2009).

Environmental contaminants enter the lower mid-Columbia mainstem region through a variety of point and non-point sources. Point sources include outfalls at a variety of agricultural, military, and industrial facilities along the river and major non-point sources including agricultural applications of pesticides, insecticides, and herbicides. Salmonids may uptake contaminants through direct contact or biomagnification through the food chain. In the lower mid-Columbia mainstem water quality is impacted by excessive sedimentation. Contaminants are suspended in sediments and accumulate in the reservoirs behind the dams (NPCC 2004c). The John Day and Dalles Reservoir areas are listed as impaired waterways for several parameters. Category 4 water quality listings for reaches of the Columbia River in Klickitat County include dioxin, total dissolved gas and invasive exotic species. Category 5 listings include 4,4'-DDE, Chlordane, dissolved oxygen, pH, PCBs and temperature.

3.4.2 Restoration Strategies

Shoreline functions along the Columbia River are limited by armoring, dam regulation, and dredging. Shoreline and floodplain habitat is fragmented by transportation infrastructure and development. Riparian vegetation is limited, and water quality in the river mainstem is impacted by excessive sedimentation. However, shrub steppe vegetation and bluffs provide upland habitat value. Restoration strategies and opportunities, highlighted in Table 3-5, emphasize riparian vegetation and enhancement of habitats for species of concern.

Table 3-5. Columbia River restoration strategies and opportunities

| Strategy | Issue(s) | Source(s)* |
|--|--|------------|
| Manage livestock in such a way as to provide for riparian vegetation restoration. | Loss of riparian vegetation | LCSP |
| Restrict access to known western pond turtle sites | Increased human disturbance of western pond turtle | LCSP |
| Remove bullfrog and non-native fish from occupied sites and control current bullfrog and non-native fish occupation in potential habitat | Loss of western pond turtle habitat | LCSP |
| Screen all irrigation pumps | Diversion of fish into unsuitable habitat | LMCMSP |
| Increase floodplain and channel roughness and reconnect side channels | Sediment load, floodplain hydrology | LMCMSP |

| Strategy | Issue(s) | Source(s)* |
|--|-------------------------------------|------------|
| Relocate floodplain infrastructure | Sediment load, floodplain hydrology | LMCMSP |
| Reestablish and/or enhance native vegetation in the floodplain, and introduce LWD as appropriate | Sediment load, floodplain hydrology | LMCMSP |

*LCSP: Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan (LCFRB 2004)
LMCMSP: Lower Mid-Columbia Mainstem (including Rock Creek) Subbasin Plan (NPPC 2004c)

In addition to the issue-based strategies and opportunities identified above, the Management Plan for the Columbia River Gorge National Scenic Area defines several enhancement objectives, summarized below, that would contribute to improvements in ecological functions along the Columbia River (Columbia River Gorge Commission 2011).

- Enhance soil water retention and reduce runoff. Give preference to use of native species.
- Protect existing oak woodlands using landowner incentives, acquisition of sensitive stands, and easements.
- Enhance and protect wildflower habitats.
- Restore anadromous fish runs.
- Conserve winter range and conserve and enhance non-game wildlife habitat.
- Enhance waterfowl and shallow-water fish habitat.
- Restore and enhance wetlands and riparian areas, including revegetation and stream channel improvements for wildlife and fish habitats.
- Encourage the use of fire to restore and perpetuate natural ecosystems.

4 IMPLEMENTATION

4.1 Restoration Partners and Ongoing Programs

Many agencies and organizations are actively engaged in the restoration and protection of shoreline ecological functions throughout Klickitat County. Partners include local, state, and federal agencies, tribes, non-governmental organizations, private companies, and private landowners. The following section provides a brief description of these entities and their key plans and programs in Klickitat County.

4.1.1 Local and Regional Agencies and Quasi-Governmental Organizations

Northwest Power and Conservation Council (NPCC)

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 authorized the NPCC to develop and maintain a regional power plan and fish and wildlife program to balance the Northwest's energy and environment needs. The NPCC is comprised of representatives from Idaho, Montana, Oregon, and Washington. The NPCC's Columbia River Basin Fish and Wildlife Program directs investment of electricity revenues into projects that improve fish passage at hydropower dams, acquire and improve fish and wildlife habitat, boost fish production using hatcheries, and implement adaptive management of these actions. Actions developed under the Columbia River Basin Fish and Wildlife Program are implemented by the Bonneville Power Administration, the Corps, the Bureau of Reclamation, and the Federal Energy Regulatory Commission.

KEY DOCUMENTS

[Columbia River Basin Fish and Wildlife Program](#) (NPCC 2014). This document describes in detail the Columbia River Basin Fish and Wildlife Program as developed by the NPCC, including a vision for the Columbia River Basin; the scientific foundation of the Columbia River Basin Fish and Wildlife Program; its restoration goals, objectives, and strategies; and an implementation and adaptive management plan.

Subbasin plans were adopted by the NPCC as part of the Columbia River Basin Fish and Wildlife Program. These include plans for the [Klickitat](#) and [White Salmon](#) subbasins (NPCC 2004a and 2004b).

Columbia River Gorge Commission

The Columbia River Gorge Commission was established in 1987 by Washington and Oregon to develop and implement policies and programs that protect and enhance the scenic, natural, cultural and recreational resources of the Gorge, while encouraging growth within the existing urban areas. The Gorge Commission works with the U.S. Forest Service to set policy for protecting the non-federal lands in the Gorge. Development within the Columbia River Gorge National Scenic Area is subject to land use regulations set by the Columbia River Gorge Commission. The management plan and land use regulations increase protection of undeveloped areas along the Columbia River shoreline in Klickitat County.

KEY DOCUMENTS

[Columbia River Gorge National Scenic Area Management Plan](#) (Columbia River Gorge Commission 2011). The Management Plan for the Columbia River Gorge National Scenic Area defines several enhancement objectives that would contribute to improvements in ecological functions along the Columbia River.

Conservation Districts: Central Klickitat, Underwood, and Eastern Klickitat

Three conservation districts are acting within Klickitat County: Underwood Conservation District, Central Klickitat Conservation District, and Eastern Klickitat Conservation District, serving the western, central, and eastern portions of the County, respectively. The districts work with landowners and land managers interested in implementing conservation practices. They provide technical assistance, cost-share assistance, monitoring, and community involvement and education to local stakeholders within their district.

4.1.2 State Agencies

Washington Department of Ecology (Ecology)

The mission of Ecology is to protect, preserve, and enhance Washington's environment, and to promote the wise management of our air, land, and water for the benefit of current and future generations. Ecology is an active partner in monitoring and improving water quality conditions in accordance with Total Maximum Daily Loads (TMDLs) in the county. Staff from Ecology provide technical support and regulatory assistance to the county and its restoration partners when needed. The agency also houses the Washington Conservation Corps (WCC), a component of the federal AmeriCorps program devoted to preservation and enhancement of natural resources. The WCC is a partner in the county's Conservation Enhancement Reserve Program.

KEY DOCUMENTS

[Little Klickitat River Watershed Temperature Total Maximum Daily Load: Detailed Implementation Plan](#) (Ecology 2005). This document provides direction to restore stream temperatures throughout the Little Klickitat River Watershed.

Washington Department of Fish and Wildlife (WDFW)

In addition to its role reviewing applications for in-water work and issuing Hydraulic Project Approvals, the WDFW develops management plans for Washington's Priority Habitats and Species. The WDFW also leads the state in resolving fish passage barrier problems through the Fish Passage Program, supporting public, state, and local agencies in their efforts to prioritize and fund fish passage barrier repairs across the state.

KEY DOCUMENTS

[Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual](#) (WDFW 2009). The manual provides a standardized, science-based methodology to evaluate and prioritize for correction fish barriers such as road crossings, instream features, dams, fishways, and other human-made instream structures.

Washington Department of Natural Resources (WDNR)

The WDNR owns and manages approximately five million acres of tidelands, forestlands, rangelands, and agriculture lands in Washington State. WDNR manages these lands for revenue, outdoor recreation, and habitat for native fish and wildlife. The WDNR is responsible for managing forest practices in Washington State through the Forest Practices Program. The Forest Practices Program and rules require the maintenance and restoration of aquatic and riparian habitat. The agency's Aquatic Restoration Program works to restore, enhance, create, and protect healthy ecological conditions in freshwater, saltwater, and estuarine aquatic systems through partnerships with agencies and organizations. WDNR provides funds, permit assistance, planning, and technical assistance for project partnerships.

Washington State Conservation Commission

The Washington State Conservation Commission is the coordinating state agency for Washington's 45 conservation districts, including the three conservation districts operating in Klickitat County (Underwood, Central Klickitat and Eastern Klickitat). The Conservation Commission works with districts to provide incentive-based programs for conservation implementation, including the Conservation Reserve Enhancement Program, the Irrigation Efficiencies Grant Program, Water Quality Grants, and the Voluntary Stewardship Program. The Conservation Commission also maintains the Conservation Practice Data System, a database for internally tracking conservation projects on private land.

Washington State Recreation and Conservation Office

The Recreation and Conservation Office (RCO) manages grant programs to create outdoor recreation opportunities, protect high quality wildlife habitat and farmland, and aid salmon recovery. The RCO supports the Salmon Recovery Funding Board (SRFB) and maintains the [Habitat Work Schedule](#), the online mapping and project tracking tool for habitat protection and restoration projects included in Washington's Salmon Recovery Lead Entity Program.

4.1.3 Federal Agencies and Organizations

U.S. Department of Agriculture (USDA)

Through its Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS), the USDA manages several conservation programs and provides partnership in the form of funding, technical assistance, and conservation planning. FSA programs include the Conservation Reserve Program, the Conservation Reserve Enhancement Program, and the Farmable Wetlands Program. NRCS programs include the Environmental Quality Incentives Program, the Wildlife Habitat incentive Program, and the Conservation Stewardship Program.

U.S. Fish and Wildlife Service (USFWS)

The USFWS manages the Conboy Lake National Wildlife Refuge (NWR) in the Glenwood Valley/Camas Prairie area. The refuge is managed as part of the Mid-Columbia River National Wildlife Refuge Complex and contains approximately 5,000 acres of marsh, meadows, grasslands, and forest. The area provides a spring migration area for Canada geese and ducks and wintering use for tundra swans, Canada geese, ducks, and bald eagles. One of three known nesting areas for sandhill cranes in Washington is located in the refuge, as is one of two known populations of Oregon spotted frogs.

National Marine Fisheries Service (NMFS)

The National Marine Fisheries Services, also known as NOAA Fisheries is an office of the National Oceanic and Atmospheric Administration (NOAA) which is responsible for the stewardship of the nation's ocean resources and their habitat. The West Coast Region office leads the development and implementation of recovery plans for salmon and steelhead species listed under the Endangered Species Act.

KEY DOCUMENTS

[ESA Recovery Plan for the White Salmon River Watershed](#), appended to the [Recovery Plan for Lower Columbia River Salmon and Steelhead](#) (NMFS 2013).

U.S. Forest Service

In addition to the Columbia River Gorge National Scenic Area (see Section 4.1.1), the U.S. Forest Service manages two Wild and Scenic Rivers in Washington State, both in Klickitat County. The lower Klickitat and lower White Salmon Rivers have received this special designation. The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for future generations.

KEY DOCUMENTS

[Lower Klickitat River Wild and Scenic River Management Plan](#) (U.S. Forest Service 1991a), [Lower White Salmon River Wild and Scenic River Management Plan](#) (U.S. Forest Service 1991b).

Bonneville Power Administration (BPA) and U.S. Army Corps of Engineers (Corps)

Together with the Corps and the Bureau of Reclamation, the BPA runs the Federal Columbia River Power System (FCRPS). The FCRPS comprises 31 federally owned multipurpose dams on the Columbia and its tributaries. In addition to generating hydroelectric power for the region, the dams are operated to protect migrating fish and to supply irrigation water. In 2008, the National Oceanic and Atmospheric Administration (NOAA) published a Biological Opinion

requiring mitigation and protection measures for ESA listed species affected by the FCRPS. The requirements include dam modifications as well as improvements to tributary and estuarine habitats to promote salmon survival.

KEY DOCUMENTS

[ESA Federal Columbia River Power System 2014-2018 Implementation Plan](#) (2013). This implementation plan describes the actions that the BPA, Corps, and Bureau of Reclamation will complete from 2014 through 2018 to improve salmon and steelhead survival under the ESA, as required by the Biological Opinion.

4.1.4 Tribes

Yakama Indian Nation

The Yakama Indian Nation (YIN) occupies a portion of the central and northern areas of the County. As a sovereign nation, the YIN has its own zoning and environmental provisions that apply within the reservation. The County has no authority on reservation lands. The YIN's Department of Natural Resources works to manage and co-manage natural resources on reservation lands, in Ceded Area, and at Usual and Accustomed Sites in accordance with YIN Treaty Rights.

Yakama Nation Fisheries is a program that was established in 1983 which employs "scientific expertise in concert with traditional ecological knowledge to develop innovative projects and partnerships credited with restoring culturally important fish runs in the Columbia River". They lead and partner on numerous restoration projects throughout the basin.

Columbia River Inter-Tribal Fish Commission (CRITFC)

The CRITFC coordinates management policy and provides fisheries technical services for the Yakama, Warm Springs, Umatilla, and Nez Perce tribes.

KEY DOCUMENTS

[Spirit of the Salmon: Wy-kan-ush-mi Wa-kish-wit](#) (CRITFC 2014). This plan uses both modern science and traditional tribal knowledge to provide a roadmap for restoring salmon, lamprey, and sturgeon populations in the Columbia River basin.

4.1.5 Non-Governmental Organizations

Columbia Land Trust

The Columbia Land Trust operates in the states of Washington and Oregon. The organization has multiple offices in and near Portland, Oregon and implements conservation and restoration projects throughout the Columbia River watershed. Their conservation and restoration efforts

span many habitat types including tidal and freshwater wetlands, floodplains, forest and shrub steppe riparian and upland areas, as well as in-stream habitat improvements.

The Freshwater Trust

The Freshwater Trust is a non-profit organization that works to preserve and restore freshwater ecosystems. The organization is headquartered in Portland, Oregon, and implements flow and habitat restoration projects throughout the region. Restoration activities include placement of large woody debris, stream realignment and reconnection, riparian plantings, water quality trading, agricultural BMP consulting, and many others.

Washington Water Trust

Washington Water Trust is a non-regulatory, non-profit organization that uses voluntary, market-based transactions and cooperative partnerships to improve and protect stream flows and water quality throughout Washington State.

4.2 Funding Mechanisms

Funding to support restoration and protection of shoreline ecological functions is available through grants from federal, state, and private entities. Various grant opportunities that may support restoration and protection activities in Klickitat County are listed in Tables 4-1 (public funding) and 4-2 (private funding).

Table 4-1. A partial list of potential public funding sources for restoration and protection of shoreline ecological functions.

| AGENCY | GRANT NAME | DESCRIPTION |
|---|---|--|
| U.S. Fish and Wildlife Service Bonneville Power Administration U.S. Department of Agriculture Natural Resources Conservation Service | Cooperative Endangered Species Conservation Fund (Section 6 of the ESA) | Grants to states to participate in a wide array of voluntary conservation projects for candidate, proposed, and listed species. |
| | Partners for Fish and Wildlife Restoration | Technical assistance and cost-share incentives to private landowners to restore fish and wildlife habitats. |
| | Fisheries Restoration and Irrigation Mitigation Program | Funds governments and tribes to install fish screens and fish passage improvements associated with water diversions. |
| | Bonneville Power Administration | Funds salmon restoration and monitoring projects. |
| | Agricultural Conservation Easement Program | Provides financial and technical assistance to help tribes, governments, and non-governmental organizations conserve agricultural lands and wetlands and their related benefits. |

| AGENCY | GRANT NAME | DESCRIPTION |
|--|---|---|
| Washington Department of Ecology | Floodplains by Design | Funding for projects that restore floodplain habitat and reduce flooding risks. |
| | Watershed Planning Act | Funding for local development of watershed plans for managing water resources and for protecting existing water rights. |
| | Centennial Grants | Funds water quality infrastructure and projects to control non-point-source pollution. |
| | Clean Water Act Section 319 Grants | Funds non-point-source pollution control projects. |
| | Clean Water State Revolving Fund Loans | Provides low interest and forgivable principal loan funding for wastewater treatment construction projects, eligible non-point-source pollution control projects, and eligible green stormwater infrastructure projects. |
| | Municipal Stormwater Grants of Regional or Statewide Significance | Provides support for NPDES Phase I and Phase II local governments. Eligible projects benefit stormwater management programs across a region or statewide. |
| Washington Department of Fish and Wildlife | Aquatic Lands Enhancement Account (ALEA) Grants | Funding to buy, protect, and restore aquatic lands habitat and to provide public access to the shoreline. |
| Washington Department of Natural Resources | Family Forest Fish Passage Program (FFFPP) | Assists private forestland owners in replacing culverts and other stream crossing structures. |
| Washington Recreation and Conservation Office | Land and Water Conservation Fund (LWCF) | Funding to preserve and develop outdoor recreation resources, including parks, trails, and wildlife lands. |
| | Salmon Recovery Funding Board Grants | Fund for projects that protect and restore salmon habitat. |
| | Washington Wildlife and Recreation Program | Provides funding for a broad range of land protection and outdoor recreation, including park acquisition and development, habitat conservation, farmland preservation, and construction of outdoor recreation facilities. |
| Klickitat County Conservation Districts (Underwood, Central Klickitat and Eastern Klickitat) | Conservation Reserve Enhancement Program | This program provides funds to farmers who maintain riparian buffers on on-site waterbodies. Funds approximately ten percent of installation costs as well as the first five years of project maintenance. |

Table 4-2. A partial list of potential private funding sources for restoration and protection of shoreline ecological function.

| GROUP | GRANT FOCUS |
|--|---|
| The Burning Foundation | Grants to protect threatened rivers, forest, and native fish populations. |
| FishAmerica Foundation | In partnership with the NOAA Restoration Center, grants for community-based restoration of marine and anadromous fish species. |
| National Fish and Wildlife Foundation | Provides funding on a competitive basis to projects that sustain, restore, and enhance the Nation’s fish, wildlife, plants, and their habitats. |
| The Konsgaard-Goldman Foundation | Grants for forest protection and initiatives addressing climate change in Washington State. |
| The Northwest Fund for the Environment | Grants to protect and restore aquatic ecosystems. |

4.3 Active and Proposed Projects

The projects described in Table 4-3 have been identified in regional plans. Together, they represent those projects that are reasonably foreseeable to occur in the near future. Some of the projects are actively underway, while others are in the preliminary phases of development. In order to correlate these projects with the issues and strategies identified in Section 3, the issue(s) associated with each project are identified.

Table 4-3. Active and proposed restoration and protection projects in Klickitat County.

1. Source, Sponsors and Funding Abbreviations

YN: Yakama Nation

SRFB: Salmon Recovery Funding Board

UCD: Underwood Conservation District

RCO: Recreation and Conservation Office

DNR: Department of Natural Resources

MCRFEG: Mid-Columbia River Fisheries Enhancement Group

CLT: Columbia Land Trust

KC: Klickitat County

FOWSR: Friends of White Salmon River

2. Status Abbreviations – A: Active/In Progress; C: Conceptual;

P: Proposed; (f): Funded

| ISSUE | PROJECT TITLE AND DESCRIPTION | SOURCE ¹ | SPONSOR/ FUNDING SOURCE ¹ | STATUS ² |
|--|---|---------------------|--|---------------------|
| WRIA 29B – WHITE SALMON | | | | |
| BUCK CREEK | | | | |
| Habitat (diversion of fish into unsuitable habitat) | White Salmon Irrigation District Fish Screen. The White Salmon Irrigation District (WSID) withdraws water from Buck Creek at river mile 2.04. Buck Creek is a significant tributary to the White Salmon River, upstream of former Condit Dam, and is being recolonized by steelhead, coho, and potentially Chinook and Bull Trout. This project involves replacing the headworks and installing a fish screen system that diverts water from Buck Creek into the White Salmon Irrigation District area of delivery. The point of diversion is currently not screened. | SRFB | UCD/SRFB | C |
| WHITE SALMON RIVER | | | | |
| Fish passage | Frank-White Salmon Trib-R10. Fish passage restoration project on a private forest land road on an unnamed tributary to the White Salmon River. The current two foot round steel culvert is undersized and is a barrier to fish passage. The culvert will be replaced with a fish passable structure. Correction of this total barrier would improve access to 0.88 miles of habitat for potential fish species including coho, steelhead and searun cutthroat trout. | SRFB | UCD/RCO | P(f) |

| | | | | |
|--------------------------|--|------|--------------|------|
| Floodplain connectivity | Designing a Project to Reconnect Lower Spring Creek Floodplain. Klickitat County will use this grant to design a project on lower Spring Creek Road that will remove a barrier to fish passage and replace it with a bridge over Spring Creek, a tributary to the White Salmon River, which is used by lower Columbia River Chinook and coho salmon and by Columbia River steelhead. | SRFB | KC/SRFB, KC | C(f) |
| Dam removal | Assessing Recovery of Salmon after Condit Dam Removal. Monitor salmon species in the White Salmon River for a second year now that the Condit Dam has been removed. Using a rotary screw trap to track Chinook and steelhead recolonization, the fisheries enhancement group will assess recolonization success and adapt management decisions. | SRFB | MCRFEG/S RFB | A(f) |
| RATTLESNAKE CREEK | | | | |
| Riparian vegetation | Rattlesnake Creek Riparian Vegetation Enhancement. Rattlesnake Creek is important habitat for salmon and steelhead, cutthroat and rainbow trout, and potentially Pacific and brook lamprey. In addition to low flows and high stream temperature, there are multiple sites challenged by invasive species, lack of adequate riparian cover/function, lack of mature conifers for future instream habitat and lack of large wood. Riparian planting, weeding and instream large wood activation to address low flows, high stream temperatures and lack of native riparian vegetation cover. | SRFB | UCD/SRFB | A(f) |
| Low flow | Upper Rattlesnake Creek Hydrologic Project. Hydrologic restoration of an important wet meadow at a key location at the downstream edge of the upper, non-fish-bearing portion of the watershed. The objectives include seasonal attenuation of the hydrograph, decreasing flood frequency, and improving water-holding capacity. UCD anticipates three design options: installation of beaver dam analog structures or post assisted willow structures, plug-and-pond methods, or remeandering the stream. This work is supported by non-RCO funding to build and repair riparian cattle fences around the proposed worksite. | SRFB | UCD/SRFB | A(f) |

| | | | | |
|--------------------------------|---|------|------------|------|
| Floodplain Connectivity | Lower Indian Creek Road Relocation Project. The current alignment of lower Indian Creek Road along Rattlesnake Creek confines flows, causes downstream flooding and stranding of residents, and damages the county road during 50- to 100-year flood events. Riprap on the south bank also increases downstream flood intensity and bank erosion. This project evaluates and seeks to a) move the road south and to a higher bench that is a minimum of 20 feet above the floodplain, and b) remove existing riprap and allow natural migration of the channel, water recharge, and attenuation of flood flows. | | MCRFCG/UCD | P/C |
| <i>MILL CREEK</i> | | | | |
| Fish passage | Scannell-Trib to Mill Creek R11. This culvert is on a tributary to Mill creek, which flows into Rattlesnake Creek. Correction of this barrier culvert would improve fish access to 0.16 miles of habitat for resident trout. | SRFB | DNR | P |
| <i>GILMER CREEK</i> | | | | |
| Fish passage | Kreps Ranch LLC- Gilmer Cr – R4. Restore barrier culverts where stream splits into several tributaries and habitat turns to open meadow with wetland plants defining the channel. | SRFB | DNR | C |
| <i>TROUT LAKE</i> | | | | |
| Riparian habitat | Trout Lake Meadow Restoration. Multiphase project to restore 35 acres of wetlands in the Trout Lake Natural Area Preserve. The department will control weeds, plant native plants, and improve the flow of water – all with the goal of improving habitat for four rare plants and animals. | SRFB | DNR/RCO | A(f) |

WRIA 30 – KLICKITAT

KLICKITAT RIVER

| | | | | |
|--|--|-------------|----------------------|-------------|
| <p>Habitat impairment</p> | <p>Klickitat Watershed Enhancement Project (KWEP). Yakama Nation Fisheries conducts the KWEP. Actions under these projects include instream large woody debris placement, culvert replacements and other passage improvements, forest road rehabilitation, floodplain reconnection, and habitat acquisition. All of these habitat actions are consistent with objectives described in the Klickitat Subbasin Plan (NPCC 2004, pp. 333-352). Assessment, monitoring and data management are also crucial components of the KWEP Program.</p> | <p>YNF</p> | <p>YN</p> | <p>A</p> |
| <p>Habitat preservation</p> | <p>Conserving Land in Klickitat Canyon. The Columbia Land Trust will use this grant to conserve 2,760 acres of a diverse landscape straddling the Wild and Scenic Klickitat River. Includes 1.4 miles of Summit Creek and .1 mile of White Creek.</p> | <p>SRFB</p> | <p>CLT/SRFB, CLT</p> | <p>A(f)</p> |
| <p>Floodplain connectivity</p> | <p>Klickitat River Floodplain Restoration. Phased project that will remove or modify a privately-owned, failing paved haul road from the active floodplain of the Klickitat River to restore natural hydrologic processes in an otherwise fully functional reach of the river.</p> | <p>SRFB</p> | <p>CLT</p> | <p>A(f)</p> |
| <p>Instream habitat, riparian and floodplain vegetation</p> | <p>Klickitat RM 12 Habitat Restoration. The project will improve habitat quality for spring chinook, summer steelhead, and winter steelhead (Tier 1 priority species). In addition to the Tier 1 species, the project reach will improve rearing, holding, and migratory habitat for fall chinook and coho salmon. Project actions will include construction of six large woody debris (LWD) jams and revegetation of 2.2 acres of floodplain along 1,625 feet of bank. An additional 2.8 acres of adjacent upland will be planted with ponderosa pine.</p> | <p>SRFB</p> | <p>MCRFEG/S RFB</p> | <p>P(f)</p> |

| | | | | |
|---------------------|---|------|-----|------|
| Habitat | <p>Klickitat RM 13 Floodplain Habitat Acquisition. Purchase of a 7.5 acre parcel on the Klickitat River that will eventually be transferred to either the Columbia Land Trust or the Washington Department of Fish and Wildlife. The property includes approximately six acres of floodplain and one acre of adjacent hillside. The property flanks a braided section of river with documented high levels of use by spawning salmon. Acquisition of this property will meet the goals of protecting high-priority functional habitats and preserving habitat forming processes. The property includes wetlands, floodplain, and both mature and immature native riparian trees and shrubs.</p> | SRFB | CLT | P(f) |
| SNYDER CREEK | | | | |
| Fish passage | <p>Snyder Creek Mill Site Fish Passage. Restore fish passage in Snyder Creek and provide steelhead and coho salmon with access to good spawning and rearing habitat above the Klickitat mill site, which is located at the mouth of the creek. Restoration work at the mill site commenced in 2003. Work completed in 2003 included installation of fish passage weirs below and within the mill flume, removal of the dam, and replacement of two culverts with bridges. Most of the work needed to restore fish passage has been completed. The work yet to be completed comprise the scope of work for the proposed Snyder Canyon Creek Mill Fish Passage project. These items are the installation of ninety-six weirs, the removal and disposal of an asbestos lined pipe, some earthwork and bank protection, and reconstruction of a section of the flume wall.</p> | SRFB | DNR | P(f) |
| WHITE CREEK | | | | |

| | | | | |
|-------------------------------|---|------|----|---|
| In-stream habitat | Tepee Creek Meadows. Tepee Creek flows into White Creek, a Klickitat River tributary that provides important spawning and rearing habitat for ESA-listed Middle Columbia River steelhead. Existing conditions in the watershed currently limit steelhead production in a variety of ways. The proposed treatment for improving degraded conditions is to raise the bed elevation of the stream by importing rock. The designed bed elevation will restore overbank flow to an approximately annual recurrence interval. | SRFB | YN | P |
| LITTLE KLICKITAT RIVER | | | | |
| Flow, temperature | Payne Bank Protection/Re-Veg. Address sediment, temperature and flow concerns on the Little Klickitat River by placing rock barbs along ~200 feet of the river bank flow will be diverted away from a highly erosive bank. Additionally, the barbs should keep the river within its channel, thus protecting the investment of another restoration project (the Lacey Rootwad Project) located adjacent to the Payne site. Native vegetation planting will help reduce high summer water temperatures as well as help reduce peak flows. | SRFB | KC | C |
| COLUMBIA RIVER | | | | |
| | No projects identified at this time. | | | |

4.4 Tracking

The SMP Guidelines require that shoreline restoration plans “... provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.”

The [Habitat Work Schedule](#) (HWS) provides the primary mechanism to track development and implementation of salmon habitat conservation and restoration projects. The HWS has the potential to track restoration actions, progress, and funding. In addition to tracking implementation of habitat projects, the Salmon Recovery Funding Board supports statewide effectiveness monitoring, which is intended to inform future activities to maximize project benefits.

The Washington State Conservation Commission’s Conservation Practice Data System (CPDS) provides a database that internally tracks projects and conservation practices on private lands.

Together, these databases provide an overall view of the projects that are proposed, underway, and recently completed in the county.

5 REFERENCES

- Allen, B., R. Engle, J. Zendt, F. Shrier, J. Wilson, and P. Connolly. 2016. Salmon and Steelhead in the White Salmon River after the Removal of Condit Dam—Planning Efforts and Recolonization Results.
- Bonneville Power Administration, U.S. Army Corps of Engineers, and U.S. Department of the Interior. 2013. Endangered Species Act Federal Columbia River Power System 2014-2018 Implementation Plan. 304 pp.
- Columbia River Gorge Commission. 2011. Management Plan for the Columbia River Gorge National Scenic Area. Available: www.gorgecommission.org/managementplan.cfm.
- Columbia River Inter-Tribal Fish Commission. 2014. Spirit of the Salmon: Wy-Kan-Ush-Mi Wa-Kish Wit. Columbia River Inter-Tribal Fish Commission. Portland, Oregon.
- Interfluve. 2013. Columbia River Shoreline Project Identification. Mainstem Columbia River: Klickitat Lead Entity Area. 31 pp. Prepared for Mid-Columbia FEG.
- Klickitat County. 2013. Klickitat Lead Entity Region Salmon Recovery Strategy.
- Lower Columbia Fish Recovery Board (LCFRB). 2004. Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan. Volume II – Subbasin Plan; Chapter K – Little White Salmon.
- National Marine Fisheries Service (NMFS). 2013. ESA Recovery Plan for the White Salmon River Watershed.
- Northwest Power and Conservation Council (NPCC). 2014. Columbia River Basin Fish and Wildlife Program. Document 2014-12, Pre-publication version. Prepared October, 2014. 76 pp. <https://www.nwcouncil.org/media/7148624/2014-12.pdf>.
- Northwest Power Planning Council (NPCC). 2004a. White Salmon Subbasin Plan. Portland, OR. May 28, 2004. <http://www.nwcouncil.org/media/116777/EntirePlan.pdf>.
- Northwest Power Planning Council (NPCC). 2004b. Klickitat Subbasin Plan. Portland, OR. May 28, 2004. <http://www.nwcouncil.org/fw/subbasinplanning/klickitat/plan>.
- Northwest Power Planning Council (NPCC). 2004a. White Salmon Subbasin Plan. Portland, OR. May 28, 2004. <http://www.nwcouncil.org/media/116777/EntirePlan.pdf>.
- Northwest Power Planning Council (NPCC). 2004b. Klickitat Subbasin Plan. Portland, OR. May 28, 2004. <http://www.nwcouncil.org/fw/subbasinplanning/klickitat/plan>.

- Northwest Power and Conservation Council (NPCC). 2014. Columbia River Basin Fish and Wildlife Program. Document 2014-12, Pre-publication version. Prepared October, 2014. 76 pp.
<https://www.nwcouncil.org/media/7148624/2014-12.pdf>.
- U.S. Forest Service (USFS). 1991a. Lower Klickitat River Wild and Scenic River Management Plan Final Environmental Impact Statement. 51 pp.
- U.S. Forest Service. 1991b. Lower White Salmon National Wild and Scenic River Management Plan. 51 pp.
- Watershed Professionals Network (WPN) and Aspect Consulting. 2005. Klickitat Basin (WRIA 30) Watershed Management Plan.
- Washington State Department of Ecology (Ecology). 2005. Little Klickitat River Watershed Temperature Total Maximum Daily Load Detailed Implementation Plan.
- Washington State Department of Fish and Wildlife (WDFW). 2009. Fish Passage and Surface Water Diversion Screening Assessment and Prioritization Manual. Washington Department of Fish and Wildlife. Olympia, Washington.
- Washington State Recreation and Conservation Office. Electronic reference. Habitat Work Schedule. <http://hws.ekosystem.us/>. Accessed May 15, 2017.
- Washington State Recreation and Conservation Office. Electronic reference. PRISM Database. <https://secure.rco.wa.gov/prism/search/projectsearch.aspx>. Accessed May 15, 2017.
- The Watershed Company (TWC). December 2016. Draft Shoreline Analysis Report for Shorelines in Klickitat County. Prepared for Klickitat County, Klickitat WA.