

## 19 Columbia Gorge Tributaries Subbasin



Figure 19-1. Location of the Columbia Gorge Tributaries Subbasin within the Lower Columbia River Basin.

### 19.1 Basin Overview

This subbasin includes tributaries in the Columbia Gorge between Bonneville Dam and the White Salmon River, excluding the Wind River and the Little White Salmon River. The subbasin is located in Skamania County and is in WRIA 29. Rock Creek (43 square miles) is the largest tributary in the subbasin.

The Columbia Gorge Tributaries Subbasin will play key role in the recovery of salmon and steelhead. The subbasin has historically supported populations of winter steelhead, chum, and coho. Today, steelhead and chum are listed as threatened under the ESA. Coho salmon are a candidate for listing. Other fish species of interest are Pacific lamprey and coastal cutthroat trout – these species are also expected to benefit from salmon protection and restoration measures.

Gorge tributary salmon and steelhead are affected by a variety of in-basin and out-of-basin factors including stream, Columbia River mainstem, estuary, and ocean habitat conditions; harvest; hatcheries; and ecological relationships with other species. Analysis has demonstrated that recovery cannot be achieved by addressing only one limiting factor. Recovery will require action to reduce or eliminate all manageable factors or threats. The deterioration of habitat conditions in the Columbia River mainstem, estuary, and plume affect all anadromous salmonids within the Columbia Basin. Direct harvest of listed salmon and steelhead is prohibited but sport and commercial fisheries focusing on hatchery fish and other healthy wild populations, primarily in the mainstem Columbia and ocean, incidentally affect ESA-listed Columbia Gorge tributary fish. Key ecological interactions of concern include effects of nonnative species; nutrient inputs

from salmon carcasses; and predation by species affected by development including Caspian terns, northern pikeminnow, seals, and sea lions. Discussions of out-of-basin factors, strategies, and measures common to all subbasins may be found in Volume I, Chapters 4 and 7. This subbasin chapter focuses on habitat and other factors of concern specific to the Columbia Gorge Tributaries Subbasin.

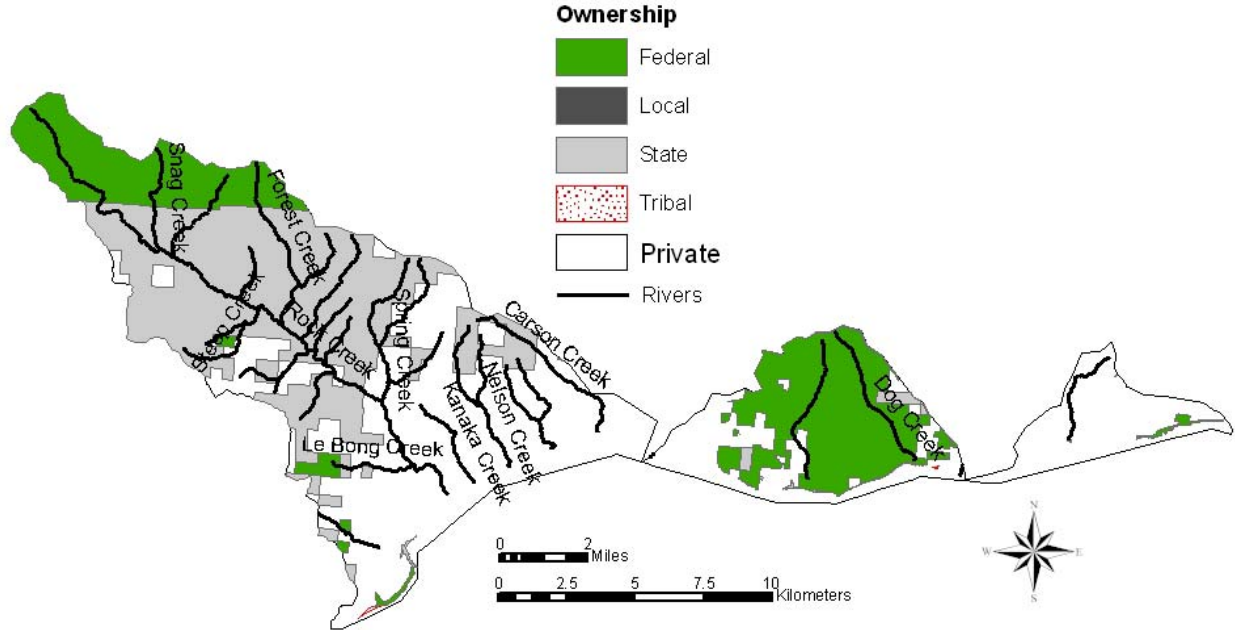
The Rock Creek basin is predominantly forestland (93%), much of it within the Gifford Pinchot National Forest. The large Yacolt Burn in 1902 destroyed much of the forest vegetation in the basin. More recently, timber harvests have served to reduce forest cover. Late-successional forests make up only 16% of the basin and early-seral conditions make up 23% of the basin. Rural residential development in the lower basin is increasing.

The smaller stream systems in the basin are mostly within private lands in either rural residential use or small-scale timber production. Lower Rock Creek and smaller streams to the east are impacted by urban development in the town of Stevenson. Carson Creek is impacted by small-scale urban development in and around the town of Carson.

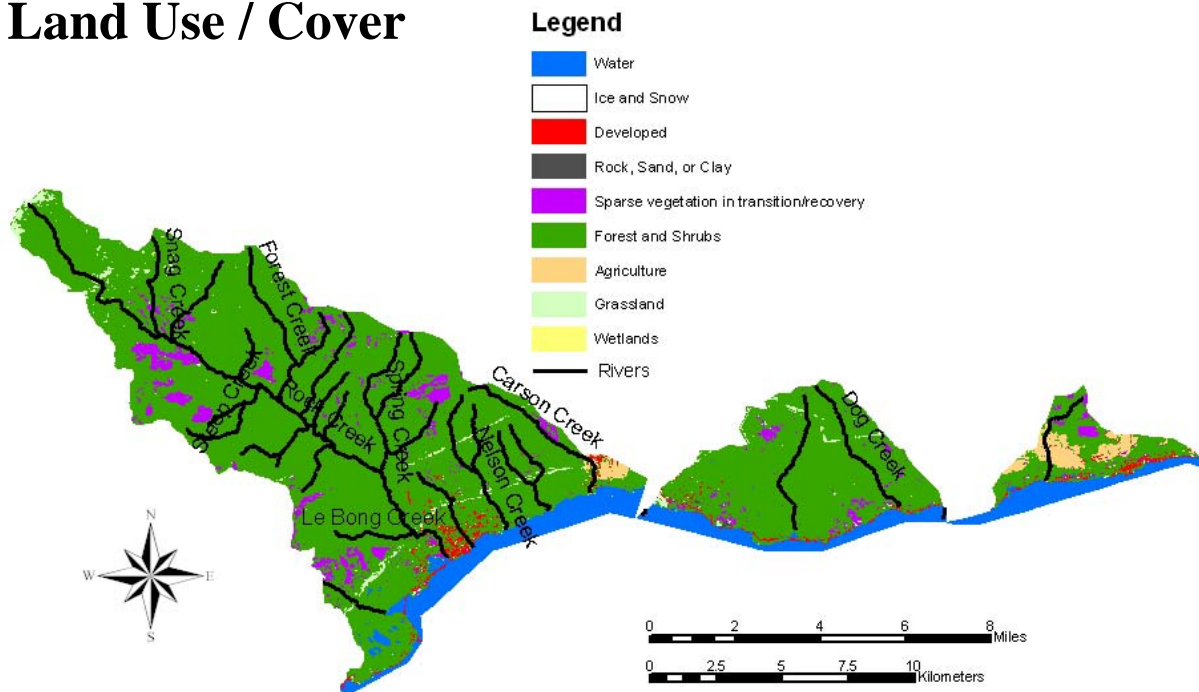
Anadromous fish access is limited to the lower reaches of Columbia Gorge tributary streams. The largest stream is Rock Creek, but access is naturally blocked by a falls at RM 1. This reach contains the greatest amount of potential habitat and is therefore the highest priority for habitat restoration and preservation measures.

Land Ownership	
Private	49%
Federal	20%
State	31%

## Land Ownership



## Land Use / Cover



## 19.2 Species of Interest

Focal salmonid species in the small upper Gorge tributaries include winter steelhead, chum, and coho. The health or viability of these populations (when included with Wind River and Little White Salmon River populations) is currently very low for chum, low for coho, and between low and medium for winter steelhead. Focal populations need to improve to a targeted level that contributes to recovery of the species (see Volume I, Chapter 6). Recovery goals call for restoring upper Gorge coho to a high viability level, providing for a 95% chance of persistence over 100 years, restoring chum to a medium viability level, providing for a 75-94% probability of persistence over 100 years, and maintaining winter steelhead at low viability levels, providing for a 40-74% probability of persistence over 100 years. Other species of interest in the upper Gorge tributaries include coastal cutthroat trout and Pacific lamprey. Regional objectives for these species are described in Volume I, Chapter 6. Recovery actions targeting focal salmonid species are also expected to provide significant benefits for these other species. Cutthroat will benefit from improvements in stream habitat conditions for salmonids. Lamprey are expected to benefit from habitat improvements in the estuary, Columbia River, and mainstem, and in the upper Gorge tributaries, although specific spawning and rearing habitat requirements for lamprey are not well known.

**Table 19-1. Current viability status of Gorge tributary populations and the biological objective status that is necessary to meet the recovery criteria for the Gorge strata and the lower Columbia ESU. Objective numbers represent combined objective for Wind and upper Gorge tributaries.**

Species	ESA Status	Hatchery Component	Current		Objective	
			Viability	Numbers	Viability	Numbers
Winter Steelhead	Threatened	No	Low+	Unknown	Low+	100
Chum	Threatened	No	Very low	Unknown	Medium	1,100-5,900
Coho	Candidate	No	Low	Unknown	High	--

Winter Steelhead–There is no specific information concerning historical or current winter steelhead populations in the small upper Gorge tributaries. Rock Creek is likely the main area with potential for natural production.

Chum– There is no specific information concerning historical or current adult chum populations in the small upper Gorge tributaries. However, current production is very low, as indicated by Bonneville Dam counts of less than 100 chum in most years. Rock Creek is likely the main area with potential for natural production.

Coho– The historical upper Gorge tributary and Wind combined early coho adult population is estimated from 1,000-10,000. Current natural spawning returns are low at about 200-300 fish. The numbers specific to the small upper Gorge tributaries is unknown. The primary spawning area is likely Rock Creek. Early coho spawning occurs from mid-October to mid-November. Juvenile rearing occurs upstream and downstream of spawning areas. Juveniles rear for a full year in the upper Gorge tributaries before migrating as yearlings in the spring.

Coastal Cutthroat– Coastal cutthroat abundance in the upper Gorge tributaries has not been quantified but the population is considered depressed. Anadromous and resident forms of cutthroat trout may be present in these small tributaries. Anadromous cutthroat enter their streams of origin from July-December and spawn from December through June. Most juveniles rear 2-4 years before migrating from their natal stream.

*Pacific lamprey*– Information on lamprey abundance is limited and does not exist for the upper Gorge tributary populations. However, based on declining trends measured at Bonneville Dam it is assumed that Pacific lamprey have declined in the upper Gorge tributaries also. Adult lamprey return from the ocean to spawn in the spring and summer. Juveniles rear in freshwater up to 6 years before migrating to the ocean.

## **19.3 Limiting Factors, Threats, and Measures**

### **19.3.1 Hydropower Operation and Configuration**

There are no hydro-electric dams in the Gorge tributary subbasin. However, Gorge tributary species are affected by mainstem Columbia hydro operations and flow regimes which affect habitat in migration corridors and in the estuary. Mainstem hydro factors and threats are addressed by regional strategies and measures identified in Volume I.

### **19.3.2 Harvest**

Most harvest of upper Gorge tributary wild salmon and steelhead occurs incidental to the harvest of hatchery fish and healthy wild stocks in the Columbia estuary, mainstem, and ocean. This mortality is very low for chum and steelhead, and low for coho. Chum are not harvested in ocean fisheries, there are no directed Columbia River commercial chum fisheries and retention of chum is prohibited in Columbia River sport fisheries. Some chum can be impacted incidental to fisheries directed at coho and winter steelhead. Harvest impacts to upper Gorge tributary coho occur in the ocean commercial and recreational fisheries off the Washington and Oregon coasts and Columbia River. There are no salmon fisheries in the upper Gorge tributaries. Wild coho impacts are limited by fishery management to retain fin-marked hatchery fish and release unmarked wild fish. Incidental mortality of steelhead occurs in freshwater commercial fisheries directed at Chinook and coho and freshwater sport fisheries directed at hatchery steelhead and salmon. All recreational fisheries are managed to selectively harvest fin-marked hatchery steelhead and commercial fisheries cannot retain hatchery or wild steelhead.

Measures to address harvest impacts are generally focused at a regional level to cover fishery impacts accrued to lower Columbia salmon as they migrate along the Pacific Coast and through the mainstem Columbia River. The regional measures cover species from multiple watersheds which share the same migration routes and timing, resulting in similar fishery exposure. Regional strategies and measures for harvest are detailed in Volume I, Chapter 7. A number of regional strategies for harvest involve implementation of measures within specific subbasins. In-basin fishery management is applicable to steelhead and salmon while regional management is more applicable to salmon. Harvest measures that have significant application to upper Gorge tributary populations are summarized in the following table:

**Table 19-2. Regional harvest measures with significant application to the Columbia Gorge Tributaries Subbasin populations.**

Measure	Description	Comments
F.M18	Monitor and evaluate commercial and sport impacts to naturally-spawning steelhead in salmon and hatchery steelhead target fisheries.	Includes monitoring of naturally-spawning steelhead encounter rates in fisheries and refinement of long-term catch and release handling mortality estimates. Would include assessment of the current monitoring programs and determine their adequacy in formulating naturally-spawning steelhead incidental mortality estimates.
F.M19	Continue to improve gear and regulations to minimize incidental impacts to naturally-spawning steelhead.	Regulatory agencies should continue to refine gear, handle and release methods, and seasonal options to minimize mortality of naturally-spawning steelhead in commercial and sport fisheries.
F.M24	Maintain selective sport fisheries in ocean, Columbia River, and tributaries and monitor naturally-spawning stock impacts.	Mass marking of lower Columbia River coho and steelhead has enabled successful ocean and freshwater selective fisheries to be implemented since 1998. Marking programs should be continued and fisheries monitored to provide improved estimates of naturally-spawning salmon and steelhead release mortality.

### 19.3.3 Hatcheries

As noted in the regional strategies, hatcheries can adversely affect wild salmon and steelhead populations in several ways. These include domestication or the reduction in the fitness of wild fish due to interbreeding with hatchery fish, direct competition between wild and hatchery fish for habitat and nutrients, and the introduction of disease. Hatcheries can also assist in recovery efforts by providing fish needed to reestablish extirpated populations or to augment wild populations that have reached critically low levels.

There are no hatchery programs in the small upper Gorge tributaries, although four federal hatcheries in the vicinity have large scale salmon programs. Carson National Fish Hatchery (since 1937) produces spring Chinook, Little White Salmon Hatchery (since 1898) and Williard National Fish Hatchery (since 1951), produce spring Chinook, fall Chinook, and coho, and Spring Creek Hatchery (since 1901) produces fall Chinook. The main threats from hatchery released fall Chinook are domestication of naturally-produced fish and the main threats from hatchery releases of spring Chinook and coho are ecological interactions with naturally-produced salmon.

Regional hatchery strategies and measures are focused on evaluating and reducing biological risks and reducing the risks to natural populations. Artificial production in federal hatchery programs will be evaluated in detail through the HGMP process. The resulting program specific actions will be developed, evaluated, and documented through the HGMP for public review and consideration by NOAA Fisheries (details in programs Technical Foundation, Volume IV).

### 19.3.4 Ecological Interactions

Ecological interactions focus on how salmon and steelhead, other fish species, and wildlife interact with each other and the subbasin ecosystem. Gorge tributary salmon and steelhead are affected throughout their lifecycle by ecological interactions with non native species, food web components, and predators. Interactions are similar for Gorge tributary populations to those of most other subbasin salmonid populations. Ecological Interactions are addressed by regional strategies and measures identified in Volume I.

### **19.3.5 Habitat – Estuary and Lower Columbia Mainstem**

Conditions in the Columbia River mainstem, estuary, and plume affect all anadromous salmonid populations within the Columbia Basin. A variety of human activities in the mainstem and estuary have decreased both the quantity and quality of habitat used by juvenile salmonids. These include floodplain development; loss of side channel habitat, wetlands and marshes; and alteration of flows due to upstream hydro operations and irrigation withdrawals. Effects are similar for Gorge tributary populations to those of most other subbasin salmonid populations. Effects are likely to be greater for chum than steelhead and coho. Estuary and mainstem effects on Gorge tributary salmon and steelhead populations are addressed by regional strategies and measures identified in Volume I and the Columbia Mainstem and Estuary Subbasin sections of Volume II.

### **19.3.6 Habitat – Subbasin Streams and Watersheds**

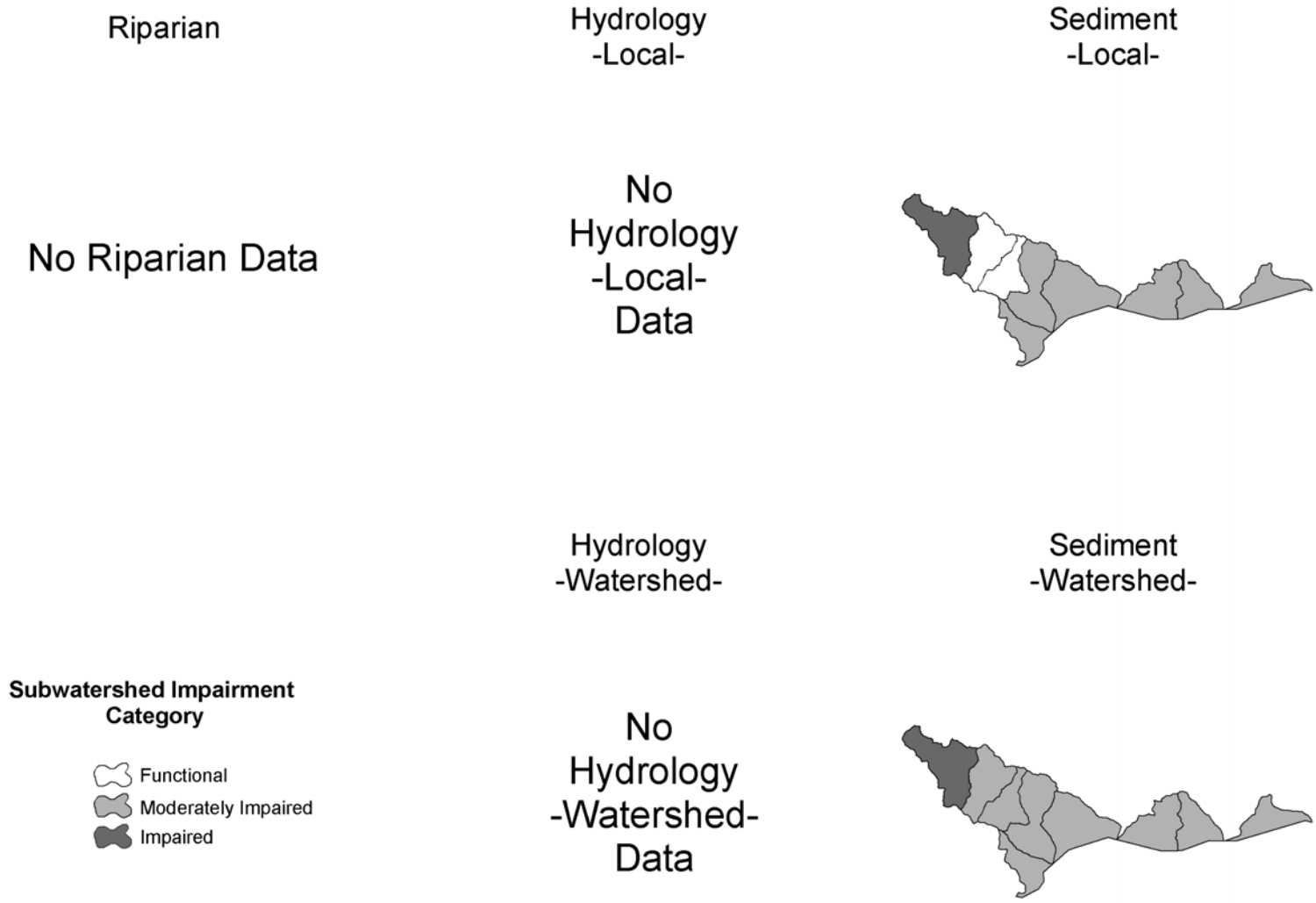
Decades of human activity have significantly altered watershed processes and reduced both the quality and quantity of habitat needed to sustain viable populations of salmon and steelhead. Moreover, with the exception of fall Chinook, stream habitat conditions within the Columbia Gorge Tributaries Basin have the greatest impact on the health and viability of salmon and steelhead relative to the other limiting factors and threats discussed in this chapter. There is currently very little habitat available to anadromous fish in the Columbia Gorge Tributaries Basin.

Due to the small amount of available habitat, the Columbia Gorge Tributary populations have not been analyzed using the EDT model and reaches have not been prioritized using the methodology applied to other subbasins. The most important reaches for anadromous fish are located only in the lower segments of streams that are accessible. The greatest amount of habitat exists in the lower mile of Rock Creek between Rock Cove and lower Rock Creek Falls (RM 1). Small amounts of habitat are also found in Nelson Creek, Carson Creek, Collins Creek, and Dog Creek. There is abundant habitat for resident fish and wildlife in other portions of these basins, particularly in the Rock Creek basin. The limiting factors and threats that are listed in this chapter were obtained through consideration of various analyses, including the USFS Rock Creek Watershed Analysis (USFS 2000) and the Washington Conservation Commission Limiting Factors Analysis for WRIA 29 (WCC 1999). A summary of the primary habitat limiting factors and threats are presented in Table 19-4. Results of IWA watershed process modeling are depicted for subwatersheds in Figure 19-2. Habitat measures and related information are presented in Table 19-3.

The areas with the greatest potential production for anadromous salmonids in the Columbia Gorge Tributaries Basin are the following:

- Lower mainstem Rock Creek – from Rock Cove to Lower Rock Creek falls (RM 1)
- Lower sections of small streams – Nelson, Carson, Collins, Dog Creeks.

While reach level habitat conditions often result from local factors, they are also affected or shaped by systemic watershed processes. Limiting factors such as temperature, high and low flows, sediment input and large woody debris recruitment are often affected by or result from upstream conditions and degraded watershed processes. Access to key reaches may also be affected by barriers that occur downstream of a reach. Accordingly, restoration of a priority reach may require action outside the targeted reach. The IWA analysis was used to identify potential upstream watershed areas that could influence reach level habitat attributes.



**Figure 19-2. IWA subwatershed impairment ratings by category for the Columbia Gorge Tributaries Basin. Watershed process impairment ratings are based on landscape conditions that influence the hydrologic regime, the sediment regime, and riparian function. See Volume II and Volume V of the Recovery Plan Technical Foundation for additional information.**





**Table 19-4. Habitat measures in priority areas, with reference to the limiting factors addressed, threats addressed, target species, and estimated time until benefits would be realized (Time). Reaches not included in the table are considered secondary priority.**

Location	Limiting Factors Addressed	Threats Addressed	Target Species	Time	Discussion
<b>1. Protect and restore riparian function</b>					
<ul style="list-style-type: none"> <li>A. Reforest riparian zones</li> <li>B. Allow for the passive restoration of riparian vegetation</li> <li>C. Invasive species eradication</li> <li>D. Hardwood-to-conifer conversion</li> </ul>					
<p><i>Lower mainstem Rock Creek</i>  <i>Lower reaches of Columbia tribs</i></p>	<ul style="list-style-type: none"> <li>• Reduced stream canopy cover</li> <li>• Altered stream temperature regime</li> <li>• Reduced wood recruitment</li> <li>• Lack of stable instream woody debris</li> <li>• Exotic and/or noxious species</li> </ul>	<ul style="list-style-type: none"> <li>• Clearing of vegetation due to urban and rural residential development</li> </ul>	<ul style="list-style-type: none"> <li>• All species</li> </ul>	20-100 years	High potential benefit due to the many limiting factors that are addressed. Riparian impairment is related to most land-uses and is a concern throughout the basin. Riparian restoration projects are relatively inexpensive and are often supported by landowners. The specified stream reaches are the highest priority for riparian measures, however, riparian restoration and preservation should occur throughout the basin since riparian conditions affect downstream reaches.
<b>2. Protect and restore instream habitat complexity</b>					
<ul style="list-style-type: none"> <li>A. Place stable woody debris in streams to enhance cover, pool formation, bank stability, and sediment sorting</li> <li>B. Structurally modify stream channels to create suitable habitat types</li> </ul>					
<p><i>Lower mainstem Rock Creek</i>  <i>Lower reaches of Columbia tribs</i></p>	<ul style="list-style-type: none"> <li>• Lack of stable instream woody debris</li> <li>• Altered habitat unit composition</li> </ul>	<ul style="list-style-type: none"> <li>• None (symptom-focused restoration strategy)</li> </ul>	<ul style="list-style-type: none"> <li>• Coho</li> <li>• Summer steelhead</li> </ul>	2-10 years	Moderate potential benefit due to the high chance of failure. Failure is probable if habitat-forming processes are not also addressed. These projects are relatively expensive for the benefits accrued. Moderate likelihood given the lack of hardship imposed on landowners and the current level of acceptance of these type of projects
<b>3. Protect and restore natural sediment supply processes</b>					
<ul style="list-style-type: none"> <li>A. Address forest road related sources</li> <li>B. Address timber harvest related sources</li> </ul>					
<p><i>Entire basin</i></p>	<ul style="list-style-type: none"> <li>• Excessive fine sediment</li> <li>• Embedded substrates</li> </ul>	<ul style="list-style-type: none"> <li>• Timber harvest – impacts to sediment supply</li> <li>• Forest roads – impacts to sediment supply</li> </ul>	<ul style="list-style-type: none"> <li>• All species</li> </ul>	5-50 years	High potential benefit due to sediment effects on egg incubation and early rearing. Improvements are expected on timber lands due to requirements under the new FPRs, the USFS Northwest Forest Plan, and forest land HCPs. Use IWA impairment ratings to identify restoration and preservation opportunities.
<b>4. Protect and restore runoff processes</b>					
<ul style="list-style-type: none"> <li>A. Address forest road impacts</li> </ul>					

Location	Limiting Factors Addressed	Threats Addressed	Target Species	Time	Discussion
<b>B. Address timber harvest impacts</b>					
<i>Entire basin</i>	<ul style="list-style-type: none"> <li>Stream flow – altered magnitude, duration, or rate of change of flows</li> </ul>	<ul style="list-style-type: none"> <li>Timber harvest – impacts to runoff</li> <li>Forest roads – impacts to runoff</li> </ul>	<ul style="list-style-type: none"> <li>All species</li> </ul>	5-50 years	High potential benefit due to flow effects on habitat formation, redd scour, and early rearing. Improvements are expected on timber lands due to requirements under the new FPRs, the USFS Northwest Forest Plan, and forest land HCPs.
<b>5. Protect and restore instream flows</b>					
<ul style="list-style-type: none"> <li><i>A. Water rights closures</i></li> <li><i>B. Purchase or lease existing water rights</i></li> <li><i>C. Relinquishment of existing unused water rights</i></li> <li><i>D. Enforce water withdrawal regulations</i></li> <li><i>E. Implement water conservation, use efficiency, and water re-use measures to decrease consumption</i></li> </ul>					
<i>Entire basin</i>	<ul style="list-style-type: none"> <li>Stream flow – altered magnitude, duration, or rate of change of flows</li> </ul>	<ul style="list-style-type: none"> <li>Water withdrawals</li> </ul>	<ul style="list-style-type: none"> <li>All species</li> </ul>	1-5 years	Instream flow management strategies for the Columbia Gorge Tributaries basins have been identified as part of Watershed Planning for WRIA 29.
<b>6. Protect and restore water quality</b>					
<i>A. Restore the natural stream temperature regime</i>					
<i>Entire basin</i>	<ul style="list-style-type: none"> <li>Altered stream temperature regime</li> </ul>	<ul style="list-style-type: none"> <li>Clearing of riparian vegetation</li> </ul>	<ul style="list-style-type: none"> <li>All species</li> </ul>	1-50 years	Primary emphasis for restoration should be placed on stream segments that are listed on the 2004 303(d) list.
<b>7. Protect habitat conditions and watershed functions through land-use planning that guides population growth and development</b>					
<ul style="list-style-type: none"> <li><i>A. Plan growth and development to avoid sensitive areas (e.g., wetlands, riparian zones, floodplains, unstable geology)</i></li> <li><i>B. Encourage the use of low-impact development methods and materials</i></li> <li><i>C. Apply mitigation measures to off-set potential impacts</i></li> </ul>					
<i>Privately owned portions of the basin</i>	<i>Preservation Measure</i> – addresses many potential limiting factors and threats		<ul style="list-style-type: none"> <li>All species</li> </ul>	5-50 years	The focus should be on management of land-use conversion and managing continued development in sensitive areas (e.g., wetlands, stream corridors, unstable slopes). Critical areas regulations do not have a mechanism for restoring existing degraded areas, only for preventing additional degradation. Legal and/or voluntary mechanisms need to be put in place to restore currently degraded habitats.
<b>8. Protect habitat conditions and watershed functions through land acquisition or easements where existing policy does not provide adequate protection</b>					
<ul style="list-style-type: none"> <li><i>A. Purchase properties outright through fee acquisition and manage for resource protection</i></li> <li><i>B. Purchase easements to protect critical areas and to limit potentially harmful uses</i></li> <li><i>C. Lease properties or rights to protect resources for a limited period</i></li> </ul>					

Location	Limiting Factors Addressed	Threats Addressed	Target Species	Time	Discussion
<i>Privately owned portions of the basin</i>	<i>Preservation Measure</i> – addresses many potential limiting factors and threats		• All species	5-50 years	Land acquisition and conservation easements in riparian areas, floodplains, and wetlands have a high potential benefit. These programs are under-funded and have low landowner participation.

## 19.4 Program Gap Analysis

The Columbia Gorge Tributaries Basin (~85 sq mi) is located in Skamania County. Forestry land uses dominate the subbasin.

- Gifford Pinchot public lands are estimated at 17 square miles;
- Department of Natural Resources public lands are estimated at 26 square miles;
- Private lands are estimated at 41 square miles;
- Skamania has regulatory authority for private lands within the Basin;
- Stevenson and Carson are unincorporated communities within the Basin;
- Population growth is expected to remain stable over the next 20 years.

### Protection Programs

Protection programs in the Columbia Gorge Tributaries Basin are implemented by the Gifford Pinchot NF, the Department of Natural Resources, Skamania County, and other regulatory agencies. Protection programs in this analysis include programs that protect habitat conditions or watershed functions through management policies and programs, regulatory measures, and fee title acquisition or the purchase of easements. Major programs implementing protection measures are identified below.

### Federal Programs

#### ➤ *Gifford Pinchot National Forest:*

- The Gifford Pinchot NF Plan provides high levels of protection for riparian areas and forest stands within the Columbia Gorge Tributaries Basin; [M.1A; M.1B; M.3A; M.3B; M.4A; M.4B; M.6A]
  - ✓ Riparian buffers in all areas of the Gifford Pinchot NF are at least 300’;
  - ✓ Forest lands within the Gifford Pinchot NF relating to the Columbia Gorge Tributaries are “Matrix,” (managed for multiple objectives);

#### ➤ *U.S. Army Corps of Engineers*

- Administers the Section 10 (Rivers and Harbor Act) and Section 404 (Clean Water Act) permit processes. Section 10 requires approval of any activity in, above, or below a navigable river, which affects course, location, condition, or capacity of navigable waters. Section 404 requires prior approval of dredging, filling, grading, clearing, and bank hardening. In waters used by listed fish species, the permits are subject to ESA Section 7 consultation with NOAA Fisheries to ensure that any approved action is adequately protective of the fish;

### State Programs

#### ➤ *Department of Natural Resources*

- State Forest Land HCP:

State forest lands are managed under the provisions of a Habitat Conservation Plan (HCP). The Habitat Conservation Plan protects riparian areas through the use of buffers, mitigates impacts on watershed processes through harvest restrictions and new road

construction standards that are more stringent than Forest Practices Rules. [M.1A; M.1B; M.3A; M.3B; M.4A; M.4B; M.6A]

- State Forest Practices:

Riparian zones and harvest restrictions represent significant protections under the State of Washington Forest Practices Rules, including the Forest and Fish Module. These rules also establish standards for new road construction. [M.1A; M.1A; M.3A; M.3B; M.4A; M.4B; M.6A]

➤ ***Washington Department of Fish and Wildlife***

- Washington State Hydraulic Code

The Washington State Hydraulic Code is administered through the Washington Department of Fish and Wildlife. The purpose of this program is to protect stream conditions and habitat. The regulations apply to such activities as stream bank protection, instream construction, culvert installation, channel changes or realignments, debris removal, and water diversion facilities. Those proposing such actions must obtain a Hydraulic Project Approval (HPA) permit;

➤ ***Washington Departments of Ecology and the Department of Fish and Wildlife:***

- Administrative flow restrictions may exist in the Columbia Gorge Tributaries Basin; [M.5A; M.5B; M.5C; M.5D]

## **Local Government Programs**

➤ ***Skamania County***

- Land Use:

Land use protections that apply to non-forested private lands within their jurisdictional authority; [M.7A; M.7B; M.7C]

- ✓ *Critical Areas stream buffers*
- ✓ *Critical Areas wetland buffers*
- ✓ *Shoreline Master Program*

➤ ***Underwood Conservation District and NRCS:*** Implements landowner and incentive programs (e.g., CREP); [M.1A; M.1B; M.2A; M.2B; M.6A]

## **Restoration Programs**

Restoration programs in the Columbia Gorge Tributaries Basin are implemented by a variety of agencies, organizations, and private interests. Major programs implementing protection measures are identified below:

### **Federal Programs**

#### ➤ ***Gifford Pinchot National Forest***

- The Columbia Gorge Tributaries Basin is not a priority restoration area in the Gifford Pinchot NF; [M.1A; M.1B; M.3A; M.3B; M.4A; M.4B; M.6A]

### **State Programs**

#### ➤ ***Department of Natural Resources***

##### State Forest Land HCP:

State forest lands are managed under the provisions of a Habitat Conservation Plan (HCP). The Habitat Conservation Plan protects riparian areas through the use of buffers, mitigates impacts on watershed processes through harvest restrictions and new road construction standards that are more stringent than Forest Practices Rules. [M.1A; M.1B; M.3A; M.3B; M.4A; M.6A]

##### State Forest Practices:

Riparian zones and harvest restrictions represent significant protections under the State of Washington Forest Practices Rules, including the Forest and Fish Module. These rules also establish standards for new road construction. [M.1A; M.1B; M.3A; M.3B; M.4A; M.6A]

### **Local Government Programs**

#### ➤ ***Skamania County***

- Public Works Program replaces and/or upgrades barriers associated with roads; [M.6]

#### ➤ ***Underwood Conservation District:***

- Underwood CD is active in the Columbia Gorge Tributaries.

## **Gap Analysis**

*Forest-related Programs:* In the Columbia Gorge Tributaries Basin, forestry programs have an important role in protecting and restoring watershed functions and habitat conditions at levels supporting recovery goals. This is because these forestry programs apply to a significant amount of the basin. Certainty of forestry-related protection and restoration programs is relatively high because programs are being implemented and funded. Program areas of concern include the continued potential for hydrologic impacts caused by past harvest practices. Monitoring of watershed processes and habitat conditions will be required to confirm the effectiveness of these measures.

*Protection-related Programs:* Lands in the Columbia Gorge Tributaries Basin have protections through Skamania County's regulatory authority. Skamania County's comprehensive plan and land use ordinances have good levels of protection; however, Best Available Science updates would improve their Critical Area Ordinances and Shoreline Master Program. In addition, as in all lower Columbia subbasins, there are very limited protection mechanisms for agricultural practices relative to riparian areas and hydrologic impairment.

*Restoration-related Programs:* Passive restoration in the forests of the Columbia Gorge Tributaries Basin will accrue over time as a result of improved forest management practices that are already in place.

**Table 19-5. Program Actions to Address Gaps**

Action #	Lead Agency	Proposed Action
CG TRIB.1	Skamania County, Stevenson, Carson	Develop and implement controls to adequately protect riparian areas to maintain currently functional and restored habitat around rivers, estuaries, streams, lakes, deepwater habitats, and intermittent streams. Require mitigation, where necessary, to offset unavoidable damage to habitat conditions in riparian management areas
CG TRIB.2	Skamania County, Stevenson, Carson	Development and implement controls to protect historic stream meander patterns and channel migration zones and avoid hardening stream banks and shorelines
CG TRIB.3	Skamania County, Stevenson, Carson	Development and implement controls and development standards to adequately protect wetlands, wetland buffers, and wetland function.
CG TRIB.4	Skamania County, Stevenson, Carson	Develop and implement controls to address erosion and sediment run-off during (and after) construction to prevent sediment and pollutant discharge to streams, wetlands and other water bodies
CG TRIB.5	Skamania County, Stevenson, Carson	Apply land use and resource protection code enforcement across jurisdictions in a consistent manner, using appropriate funding levels and application
CG TRIB.6	LCFRB, WDNR, WSDOT, WDFW Counties, private property owners.	Develop and implement a coordinated and strategic barrier removal program based on watershed fish priorities and ensuring an effective and efficient sequencing of barrier removal work.
CG TRIB.7	Skamania County, Underwood Conservation District	Utilize a combination of public outreach/education and, incentives, and to promote (1) stewardship practices for protecting habitat and water quality and (2) landowner support of and participation in habitat restoration efforts.
CG TRIB.8	State of Washington (DOE, DFW)	Close the Columbia Gorge Tributaries Basin to further surface water withdrawals, including groundwater in connectivity with surface waters; curtail unauthorized withdrawals
CG TRIB.9	LCFRB, WDFW, Skamania County, Underwood CD, LCFEG	Build capacity (e.g. technical and administrative skills, personnel and fiscal resources) needed to allow agencies and organizations to undertake protection and restoration projects, including noxious weed control in a reasonable period time.
CG TRIB.10	SRFB, BPA, NOAA, USFWS, DOE, ACOE	Increase available funding for projects that implement measures and address underlying threats
CG TRIB.11	State of Washington (Dept of Agriculture, and Department of	Develop and implement agricultural practices and regulations to protect riparian conditions and water quality



	Ecology)	
CG TRIB.12	Underwood CD	Expand landowner incentive (e.g. CREP) and education plans to promote further habitat protection and restoration.
CG TRIB.13	LCFRB, Underwood CD, Skamania County	Address threats proactively by building agreement on priorities among the various program implementers
CG TRIB.14	FEMA	Update floodplain maps using Best Available Science