

CHAPTER 4 - ACTIONS AND OBJECTIVES

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Habitat is critical! No sustained recovery of salmon is possible without healthy habitat.

Forests, rangeland, rivers, and salmon have the internal capacity to recover from major disturbances. They have been doing so for thousands, if not millions, of years. The principal role for people in the recovery of salmonids is not to interfere in the natural recovery process, but to control their own behavior in a way that lets natural recovery take place. In other words, there is a strong need for the practice of stewardship that encourages the natural healing process. There are specific things we can do to assist salmon in their recovery, but what we do must work with the strengths of the salmon¹.

A. STREAM CHARACTERIZATIONS

For projects to be successful, we must work within the constraints of the physical properties of the streams and adjacent landscapes. Within the Coquille watershed, stream reaches can be described by geomorphic characterization of channel forms and processes. This characterization is a useful way to group streams since those which have similar forms and processes are likely to respond to management and restoration in a similar manner. Streams which support the life cycle of salmonids in the Coquille have been characterized as follows below. Table 4-1 details the "typical" characteristics of each of these types of channels.

ZONE 1: STEP - POOL CHANNELS: Fairly steep and narrow channels confined by bedrock and mass movements. Stream gradients range between 2 and 10%. These channels are found in the forested uplands of federal, state, and private timber ownership.

ZONE 2: POOL - RIFFLE CHANNELS: These channels are formed by the interaction of hydraulics, sediment transport, and resistant boundaries. The stream gradients are moderate ranging between 0.5 and 2%. The streams are located in upper, alluvial valley areas.

ZONE 3: MEANDERING CHANNELS: These channels have low gradients of less than 0.5%. These are alluvial channels with broad, well defined floodplains.

¹The 1997 Oregon Plan, Chapter 6, pg 6-3 & 6-4.

**TABLE 4-1
TYPICAL STREAM HABITAT IN A GEOMORPHIC CONTEXT**

		ZONE 1 Step - Pool 2<S<10	ZONE 2 Pool and Riffle 0.5<S<2	ZONE 3 Meandering S<0.5
C H A N N E L F O R M	Particle Size	Boulders and cobble with some gravel and fines	Gravel, cobbles, fines with some boulders	Predominantly sand with occasional gravel and silt/clay
	Bedforms	Well-developed boulder, bedrock and wood steps/cascades with pools	Well-developed bars (alternate, point, braid) and pools	Presence of point, side, mid-channel, and delta bars and pools
	Pool Forming Agents	Pools controlled by boulder and wood steps and bedrock	Bedrock, woody debris, vegetated banks at channel bends, channel scour	Woody debris, vegetated banks and channel bends
	Pool Spacing	Small pools in cascades: 0.5-1 channel width/pool Larger pools: 2-4 channel widths/pool	Averages 5-7 channel widths/pool: range 4-10	Averages 5-7 channel widths/pool
	Constraining Agents	Bedrock, mass movements, alluvial fans, valley walls	Terraces, bedrock, valley walls	Presence and condition of riparian vegetation, terraces, diking
C H A N N E L P R O C E S S E S	Discharge Regime	Relatively rapid rises and falls	Longer rises, more sustained high flows	Longer rises, more sustained high flows, tidal influence
	Sediment Transport	Fine sediment - Frequent (1-2 x / year) Coarse sediment - Infrequent (10-50 Years)	Most sediment transported over fairly narrow range of flows Approximately bankfull (1-2x / year); energy limited	Most sediment transported over fairly narrow range of lows Approximately bankfull (1-2x / year); energy limited
	Disturbance Processes	Debris-laden and dam break floods, debris flows, stream side slides and earthflows	High flows, woody debris transport ---> lateral channel changes	High flows, woody debris transport ---> lateral channel changes
	Sediment Storage	Moderately low; some floodplain development	Moderately high in bars, floodplains, terraces	Moderately high in bars, floodplains, terraces
W O O D Y D E B R I S	Source	Mass movements, terraces, floodplains	Upstream sources, channel adjacent floodplains, terraces, vegetated bars and islands	Upstream sources, channel adjacent floodplains, terraces, vegetated bars and islands
	Input Mechanisms	Blowdown, mass movements, bank erosion	Upstream sources during flooding, blowdown, bank erosion, floodplain stripping	Upstream sources during flooding, blowdown, bank erosion, floodplain stripping
	Distribution	Within, across, and marginal to channel; larger accumulations from debris flows, earthflows, dam-break floods	Marginal to channel; heads of bars and islands	Marginal to channel; heads of bars and islands
	Redistribution Potential	Moderate during high flows (length < channel width)	Moderated/high during peak flows (length < channel width)	Moderated/high during peak flows (length < channel width)
	Ecological Roles	Cover, complex pool habitat, minor pool-forming potential	Cover; complex pool habitat; important pool-forming element potential	Cover; complex pool habitat; important pool-forming element potential

B. ACTIVITIES BY LIMITING FACTORS AND ZONES

Actions to conserve and restore salmon must be worked out by communities and landowners, with local knowledge of problems and ownership in solutions. The CWA is an important local partner in the grassroots effort for accomplishing the work done on private land and coordinating, where appropriate, with federally funded projects occurring on public lands in upper watershed areas.

The CWA has the following objectives in project implementation:

To Promote stewardship through public involvement. Many of the proposed restoration components will encourage ongoing landowner maintenance. Restoration projects implemented on private lands allow landowners to become aware of environmental concerns and possible restoration prescriptions. In addition, volunteers will be utilized for re-treatment of plantings as necessary. All educational opportunities will be maximized.

To Coordinate to expedite and streamline necessary permits. Multi agency involvement in scoping and streamlining the permit process will be essential at the conceptual phase of project planning. This component is vital to the private landowner participation.

To Act quickly to accomplish restoration tasks and demonstrate success within the community. Demonstrate to the community that this is an action orientated organization. The CWA will work with private land managers to develop site specific management proposals to implement restoration activities in subwatersheds. The council will strive for on-the-ground restoration based on sound planning.

The CWA will attempt to identify potential limiting factors by stream zones and use Table 4-2 as a basis for appropriate project types.

**TABLE 4-2
RESTORATION ACTIVITIES**

Limiting Factor	Objectives	Sub-watershed of Concern	Restoration Activities			Zones of Focus
			Zone 1	Zone 2	Zone 3	
Sediment Production	Reduce Sediment Loading	All	*Road Decommissioning and maintenance *Culvert maintenance and replacement *Storm-proof stream crossings	*Culvert maintenance and replacement *Riparian re-vegetation and protection *Erosion controls	*Re-vegetate and protect *Streambank erosion controls	1
Temperature	Reduce to Under 64° F	All	*Re-vegetate and protect riparian areas	*Re-vegetate and protect riparian areas	*Re-vegetate and protect riparian areas	2, 3
Dissolved Oxygen	Increase to 90% Saturation	Main Stem	*Re-vegetate and protect riparian areas	*Re-vegetate and protect riparian areas	*Re-vegetate and protect riparian areas *Correct STP failures *Limit organic loading from nonpoint sources	3
Wetland Losses	Restore within the altered landscape additional wetland habitat	Main Stem & N., S., & M. Forks		*Off channel alcoves and ponds *Allow meandering *Remove levees and dikes	*Off channel alcoves and ponds *Allow meandering *Remove levees and dikes	2, 3
Channel Connectivity	Enhance connectivity to flood plains in low gradient valleys	N., S., & M. Forks	*Re-vegetate and protect riparian areas *Instream structure	*Re-vegetate and protect riparian areas *Instream structure	*Tidegate retrofits *Re-vegetate and protect riparian areas *Instream structure	2, 3
Long Term Woody Debris	Ensure that long term large woody debris sources are available	All	*Re-vegetate and protect riparian areas *Interplant conifers in hardwood stands	*Re-vegetate and protect riparian areas *Interplant conifers in hardwood stands	*Re-vegetate and protect riparian area *Interplant conifers in hardwood stands	2

TABLE 4-2 Cont.

Limiting Factor	Objectives	Sub-watershed of Concern	Activities			Zones of Focus
			Zone 1	Zone 2	Zone 3	
Gravel Production	Provide gravel where limited	N. & M. Forks		*Strategically place gravels		2
Gravel Location	Trap gravel to ensure optimal spawning habitat	All Forks	*Instream structure, weirs	*Instream structure		1, 2
Channel Complexity	Provide interim large woody debris to the system	All Forks	*Instream structures, weirs, small wood, etc.	*Instream structure, Christmas trees, etc	*Instream structure, Christmas trees, etc	2
Migration Barriers	Ensure fish passage to spawning and rearing habitat	All	*Replace or realign culverts *Build jump pools and ladders *Baffles	*Replace or realign culverts *Build jump pools and ladders *Baffles	*Retrofit or remove tide gates	2

Appendices I - L provide details regarding criteria for implementation of several of these restoration components.

1. POTENTIAL PROJECTS ZONE 1- UPLANDS, STEP-POOL CHANNELS

- a. Identify and Treat Sources of Sediments. Treatment of chronic sediment sources will include:
 - Road treatments - decommissioning, maintenance, culvert maintenance and retrofit.
 - Compliance with the Forest Practices Act.
- b. Treatment and/or removal of fish passage barriers.
 - Culvert assessment and modification where needed.
- c. Enhance riparian vegetation. Plantings, species diversification, hardwood release.

2. POTENTIAL PROJECTS ZONE 2 - UPPER ALLUVIAL VALLEYS, POOL-RIFFLE CHANNELS

- a. Identify and Treat Sources of Sediments. Treatment of chronic sediment sources will include:
 - Road treatments - decommissioning, maintenance, culvert maintenance and retrofit.
 - Compliance with the Forest Practices Act.
- b. Treatment and/or removal of fish passage barriers.
 - Culvert assessment and modification where needed.
- c. Plant and Protect Stream Corridors. Restore native vegetation to stream corridors in low gradient valleys. Restoration activities will include:
 - Plant and diversify riparian zone with shade-producing mix of site appropriate native trees and shrubs.
 - Fence riparian zones. Design on a site specific basis, e.g., electric, woven wire, barbed wire etc.
 - Provide stream-crossing structures and keyhole or off channel watering sites for livestock.
 - Provide stock driveways where stream protection goals warrant.
 - Provide alternative resource areas for stock, e.g., position watering, salt sources, fly control equipment, and shade away from stream corridors.
 - Promote the application of good animal husbandry and management, e.g., good pasture management.
 - Promote alternative pasture management techniques to improve riparian areas, e.g., riparian pastures.
- d. Provide in-stream structure for fish. Treatments might include log weirs, boulder deflectors, scour structures, and cover structures.
- e. Construct off-channel alcoves for fish. These features will serve as off-channel refuge areas during winter high flow events.
- f. Maintain and/or improve floodplain rearing areas for fish. These features will serve as off-channel refuge areas during winter high flow events.
- g. Reduce fecal coliform loading from point sources and non-point source agriculture.
- h. Install and manage an improved flow and precipitation monitoring network. Better document the impacts flow has upon water quality and project impacts on flow.
- i. Apply soft erosion control approaches to stable but eroding streambanks utilizing soil bioengineering. Re-sloping for riparian plantings and instream structure techniques should be applied as energy dissipation is accomplished. Identify those sites where circumstances prohibit the application of soft erosion control approaches. Treatment and/or removal of fish passage barriers.

3. POTENTIAL PROJECTS ZONE 3 - FLOODPLAIN, MEANDERING CHANNELS

Extensive work needs to be done in the lower reaches of the Coquille system where sedimentation has occurred in low gradient stream reaches, behind tide gates, and at the head of tide. Slack water

conditions created by tide gates have interfered with sedimentation processes within low gradient tributaries. Extensive agricultural management activities promoting rapid drainage of lowlands have resulted in estuarine, wetland, and floodplain resource losses. In addition, riparian zones have been removed providing unstable embankments, lack of shade, and resulting temperature elevation and dissolved oxygen reductions.

- a. Identify and Treat Sources of Sediments. Treatment of chronic sediment sources will include:
 - Road treatments - decommissioning, maintenance, culvert maintenance and retrofit.
 - Compliance with the Forest Practices Act.
 - Remove sediments behind tide gates.
- b. Plant and Protect Stream Corridors. Restore native vegetation to stream corridors in low gradient valleys. Restoration activities will include:
 - Plant and diversify riparian zone with shade-producing mix of site appropriate native trees and shrubs.
 - Fence riparian zones. Design on a site specific basis, e.g., electric, woven wire, barbed wire etc.
 - Provide stream-crossing structures and keyhole or off channel watering sites for livestock.
 - Provide stock driveways where stream protection goals warrant.
 - Provide alternative resource areas for stock, e.g., position watering, salt sources, fly control equipment, and shade away from stream corridors.
 - Promote the application of good animal husbandry and management, e.g., good pasture management.
 - Promote alternative pasture management techniques to improve riparian areas, e.g., riparian pastures.
- c. Construct off-channel alcoves for fish. These features will serve as off-channel refuge areas during winter high flow events.
- d. Maintain and/or improve floodplain rearing areas for fish. These features will serve as off-channel refuge areas during winter high flow events.
- e. Manage fecal coliform sources. Currently the cities of Coquille and Myrtle Point are working to improve effluent quality. The Bandon STP has recently been upgraded. Myrtle Point and Coquille are under stipulated and final orders (SFO) to improve effluent quality.
- f. Restore tidal flows behind tide gates through the promotion of creative management, e.g., window installation, manually opening when possible, etc.
- g. Restore and enhance historic floodplains through conservation easements and wetland programs.

C. RESTORATION ACCOMPLISHMENTS

**TABLE 4-3
RESTORATION ACCOMPLISHMENTS 1990 - 1996**

Limiting Factor	Objectives	Sub-watershed of Concern	Restoration Accomplishments
Sediment Production	Reduce Sediment Loading	All	<ul style="list-style-type: none"> • 20 Miles of Road Decommissioning • 20 Miles of Road Erosion Control • 1 Bridge Installation • 7 Walk-through Gates • 3 Water Crossings
Temperature	Reduce to Under 64° F	All	<ul style="list-style-type: none"> • 49.2 Miles of Riparian Planting/Release • 27.5 Miles of Fence • 300 Feet Fence Repair
Dissolved Oxygen	Increase to 90% Saturation	Main Stem	
Channel Connectivity	Enhance connectivity to flood plains in high gradient valleys	N., S., & M. Forks	
Long Term Woody Debris	Ensure that long term large woody debris sources are available	All	
Wetland Losses	Restore within the altered landscape additional wetland habitat	Main Stem	<ul style="list-style-type: none"> • 6 Side Channels • 1 Side Channel Reconnect • 10 Off-Channel Pools • 1 Alcove Pool • 7 Pool Repairs
Gravel Production	Provide gravel where limited	N. & M. Forks	
Gravel Location	Trap gravel to ensure optimal spawning habitat	All Forks	<ul style="list-style-type: none"> • 45 Boulder Weirs • 97 Boulders • 228 Log Structures • 92 Root Wads • 2 Gabiensi • 2 Debris Catchers • 14 Structure Repairs
Channel Complexity	Provide interim large woody debris to the system	All Forks	<ul style="list-style-type: none"> • 261 Tree Bundles • 20 Whole Trees • 66 Logs • 499 Tree Strings
Migration Barriers	Ensure fish passage to spawning and rearing habitat	All	<ul style="list-style-type: none"> • 6 Culverts Replaced/Modified/Opened • 2 Passage Structures • 16 Debris Jams Opened • 1 Fish Ladder Opened

D. STATE AND FEDERAL GOVERNMENT ACTIONS

Many state and federal agencies administer laws, policies, and management programs that have an impact on salmon. These agencies are responsible for fishery harvest management, production of hatchery fish, water quality, water quantity, and a wide variety of habitat protection, alteration, and restoration activities. Under the Oregon Plan, all government agencies that impact salmon are accountable for coordinated programs in a manner that is consistent with conservation and restoration efforts.² Detailed workplans contained in Chapter 17 will have a bearing on the Coquille watershed, such as:

Chapter 17C - State Agency Workplans
Chapter 17D - Federal Agency Workplans
Chapter 17E - Actions to Reduce Risk to Core Areas
Chapter 17G - AOC/LOC, Evaluation of Contribution to OSCRI
Chapter 17H - Oregon Ports Measures, Contribution to OSCRI
Chapter 17I - Oregon's Land Use Program
Chapter 17J - Habitat Restoration Guides
Chapter 17K - Summary of Statutes and Administrative Rules

Watershed analyses are in progress, or have been completed for federal land managed by both the BLM and the USFS as shown in Figure 4-1. These analyses include: a summary of the current social, physical, and biological environment; land management allocations; and opportunities for habitat enhancement on public land.

E. PERTINENT REGULATIONS

1. THE PERMITTING PROCESS

Different state and federal agencies are required by statutes to regulate activities such as archaeological disturbances; confined animal feed lots; placement of project signs along highways; and activities that affect the waters of Oregon and the United States. An important and necessary component of watershed restoration and enhancement work will be identifying pertinent statutes and the agencies who regulate those statutes and obtaining the necessary permits to conduct restoration and enhancement activities. Appendix H contains information on the permitting process and relevant county, state, and federal agencies involved in the regulatory process.

²The 1997 Oregon Plan, Overview, pg 3.

**FIGURE 4-1
WATERSHED ANALYSES COMPLETED OR IN PROGRESS**