

# Pacific Salmon Commission



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## Coquille River Watershed Habitat Enhancement Project

### FINAL REPORT



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### ***Background on the problem which generated the project***

Limiting factors for the decline of anadromous fish populations within the Coquille Watershed include substantial loss of spawning gravel due to past splash dams and loss of juvenile over-wintering habitat due to stream channelization and diking. This project addresses these factors by completing habitat restoration projects within key tributaries of the Coquille River Watershed. The work includes placement of large woody debris and boulders within high priority streams and reconstruction and of estuarine wetlands in the lower Coquille Watershed.

### ***A description of the work done, placing it in the larger watershed context.***

The Coquille Watershed Association is currently working under the Coquille Watershed Action Plan version 2.0, the Coquille Basin Limiting Factors Report, **Prepared for NOAA Fisheries March 31, 2005**, and the Coquille Subbasin Plan, 2007. The Subbasin Plan was drafted by the Coquille Indian Tribe. It completes the final phase of a subbasin planning effort which they began with the completion of the Coquille Basin Limiting Factors Report in 2005. This report was updated and expanded for inclusion in the Subbasin Plan. Portions of it were incorporated into Chapter 3 and in Appendices A.1-A.4 to form a single, seamless planning document. Copies of these plans are available upon request.

The funding for this grant included work on three separate private properties within the Coquille River Watershed. The projects improved the productivity potential of the Coquille Watershed anadromous fish populations by increasing the amount of available spawning areas as well as improving juvenile survival by enhancing rearing habitat. Spawning success is will be improved by installing and stabilizing instream structures and retaining stream gravel. Juvenile survival is expected to increase due to the increase in available over-wintering habitat.

Below is an overview of each project site and work completed.

### ***Overview: Hall Creek (T29S, R13W, S11) Landowner – Chuck Schrader***

Hall Creek is a tributary to the Mainstem that enters at river mile 32.5. The lower Mainstem Coquille tributaries are key habitats for coho spawning, but more importantly for juvenile rearing habitat. These low gradient meandering streams were historically used as over wintering habitat by coho that migrated from the upper reaches of the watershed during high winter flows. The Hall Creek watershed is 12,200 acres and is habitat for Coho, Steelhead, cutthroat trout as well as many other non-anadromous fish and wildlife species. Landownership in the Hall Creek watershed is entirely private. The land use is split between agriculture (lower 4 miles) and timber production.

Hall Creek at the project site is approximately 15 feet wide (bankfull width) and has very little riparian vegetation other than pasture grasses. This slightly meandering stream has no wood or rock structure throughout the project reach and lacks stream complexity. The gradient of the stream at the project site is less than 2% and the habitat is almost entirely a glide/pool complex. According to the landowner, Hall Creek was not splash-dammed but was used as log storage and transport during the 1930's and 40's.

The stream was also “cleaned” (wood was removed because it was believed to impede fish passage) in the 1970’s which effectively removed any remaining structure within the channel. The stream substrate is mostly sand and silt with no spawning gravel at the project site. Agricultural practices removed any riparian vegetation to maximize grazing on the property, so there is no wood available for future LWD recruitment. The stream banks are very eroded and bare and contributing fine sediments to the stream.

The riparian area of Hall Creek at the project site is nearly completely dominated by grasses. There is very little tree or shrub cover. Surviving trees within the area are willow, ash and spruce. The CWA has recently completed a riparian enhancement project at this site (as part of a different grant), which included livestock fencing and planting within the riparian area with native trees and shrubs and establishing an off-channel water system for the livestock.

***Work completed: Hall Creek (T29S, R13W, S11) Landowner – Chuck Schrader***

For this project, the CWA crew installed logs and boulders in Hall Creek to create complexity and cover for fish. The project consisted of placing logs in the creek and anchoring with rock and existing trees in the riparian area. Log sizes were 18” DBH to 24” by 30’ long. Rocks and logs were placed using an excavator from the bank. A total of 10 sites were constructed. Rock size was ½ to 1 and ½ cubic yard. The project was completed on 7-30-07.

All disturbed sites were re-vegetated with a seed mix and mulch. The project sites were barren of instream woody debris, prior to the project activity.

***Project Tangible Benefits: Hall Creek (T29S, R13W, S11) Landowner – Chuck Schrader***

The Oregon Department of Fish and Wildlife Aquatic Habitat Inventory and Analysis Benchmarks will be used as goals for measuring the following objectives:

- Increase large woody debris volume.
- Increase complexity and cover in pools
- Increase gravel retention
- Improve channel incision
- Improve floodplain connectivity

The broader goals of this project are to provide enhanced over-wintering habitat for salmonid juveniles by providing micro-habitat within the channel (e.g. side channels, back eddies, off-channel habitat, etc.). This type of instream habitat is beneficial to the juvenile salmonids released into Hall Creek by the local volunteers of the Salmon Trout Enhancement Program.

To date noticeable changes are apparent in stream depth and stream bed complexity below the log/boulder structures. The logs and boulders placed in the stream have increased specific scouring patterns and have created very deep pools in the sand and gravel substrate, which will provide a source of cover and refuge for aquatic life.

### ***Overview: Snyder Wetlands (T28S, R14W, S25) Landowner- Pete Snyder***

This project was identified as a high priority project for wetland enhancement adjacent to the mainstem Coquille River.. The property is in Sections 25 & 26 of T28S, R14W, Willamette Meridian, around river mile 10, and is owned by Peter & Theresa Snyder.

The site consists of about 95 acres of bottomland. Bisecting the upper end of the property is a 20-30 foot wide slough that was shallow, stagnant and serviced by a tide-gate. About 40 acres of this area are jurisdictional wetlands.

The slough is bordered by pastures covered mostly with reed canary grass, underlain by the ground-hugging, nitrogen-fixing legume, bird's foot trefoil. In the lower-elevation jurisdictional wetland meadows, patches of soft rush, yellow flag, spike rush, soft rush flourish. Salt grass, a salt tolerant plant, also grows in the lower areas around the slough.

The site receives a seasonal flow of freshwater from a couple of small drainages flowing from the adjacent hill slope. A ditch with a 150-foot long inlet and 18-inch diameter culvert also drains the property. The tidegate on this culvert is no longer operational and allows above about 6 ft Mean High Water (MHW) into the ditch. Tidal range in the river is about 7 ft, but the culvert captures only the upper 1 to 2 ft of the spring tides. Tidal stages about 2 ft higher than Mean Higher High Water (MHHW) spill out of this ditch and flood the lower elevation area adjacent to it.

Between the bottomland and the river is a natural 6-ft high, nearly 200-ft wide levee that keeps most tidewater off the property. It is lined by a 60-80 ft wide 2.7-acre riparian corridor with willow, red alder, and Oregon ash. A Coquille Watershed Association project in 1996 planted several Sitka spruce and western red cedar, most are between 4 and 12 ft tall at this time.

In 2004, open channel tidal flows between the Coquille and the project site were established by removing a section of dike along the Mainstem, and constructing a new inlet on the Snyder property. The constructed inlet was carved eastward through the river levee at the north end of the Snyder property. An enormous spruce log was buried in the location of the riverbank where the new inlet throat was constructed. Excavation along the upriver side of this log will serve as the inlet's downriver bank. The existing willow/ ash thicket served as the upriver bank. Logs will be incorporated into the bed and banks. About 600 ft from the throat, multiple channels were constructed, creating islands. Pools were also constructed at specific locations within and adjacent to the existing slough to provide deep-water habitat.

Flooding of the adjacent property was prevented by the construction of a berm along the property boundary to equal the height of the levee. Spoils from the construction of the inlet were used to construct the berm. Across the slough at the north end of the property, a rock and log structure was constructed with a 1-foot high window at its base that will allow a small volume of water to flow through the slough. At the south end of the project site, the spoils were used to heighten the road.

### ***Work completed: Snyder Wetlands (T28S, R14W, S25) Landowner- Pete Snyder***

The project restored tidal action to approximately 5 acres of sub-tidal habitat, which connects to 20 acres of enhanced wetland. The effort is maintaining and improving existing environmental conditions, while allowing the landowner to pursue permitted land use practices on the remaining property. Juvenile salmonids now have access to this estuarine habitat at all phases of the tides.

The specific objectives achieved are as follows:

- Restore 5 acres of tidal influenced wetland to lower Coquille valley,
- Connect 20 acres of enhanced wetland to tidal influence
- Create over wintering habitat and improve access to wetlands for juvenile salmonids, specifically coho salmon.

This project involved excavating new pond areas and channels that connect to the previous wetland work completed on this property. The pond depth will retain water at all phases of the tidal flows. The water control structures also maintain flows in the channel at low tide, preventing fish from being trapped or stranded. The berms and dikes were planted with native species.

***Project Tangible Benefits: Snyder Wetlands (T28S, R14W, S25) Landowner- Pete Snyder***

The expected outcomes from this project will provide over-wintering habitat, structure for cover and refuge during winter flows for juvenile salmonids.

The project opened up a diked lowland field and connects 20 acres of reestablished wetland to a precious wetland restoration project.

Juvenile fish surveys have documented juvenile salmonids using the ponds as off-channel refuge and over-wintering habitat.

***Overview: North Fork Coquille (T26S, R11W, S28) Landowner – Scott Williams***

The North Fork Coquille Watershed drains 154 square miles. This tributary of the Coquille was splash dammed in the 1930's, which scoured out much of the instream structure such as large boulders and wood during the release of the impounded water and logs. Large sections of bedrock remain within these systems.

Limiting factors of this area are lack of spawning gravel, over-wintering habitat and stream complexity. Bankfull width is 50-60 feet at the project site. Currently, substrate in the project area is 30% sand/silt, 40% gravel/cobble and 30% bedrock. Each winter due to the lack of instream structure, the substrate deposition sites change. The site has future potential for large woody debris (LWD) recruitment. This site had a riparian enhancement project completed on it in 1998 by the Coquille Watershed Association. A fence was constructed along the riparian area to exclude livestock and a mixture of native trees was planted. The trees are free to grow at the height of 6-8 feet. The east side of the stream has good tree cover and vegetation which could also contribute future LWD.

The current landowner has expressed interest in planting more trees within the fenced section after the instream project is completed.

The North Fork Coquille at this site is utilized by coho, chinook, steelhead, cutthroat and lamprey for spawning habitat. Juvenile and adult salmonids are able to pass above and below the project area.

***Work completed: North Fork Coquille (T26S, R11W, S28) Landowner – Scott Williams***

This small stretch of stream had two full spanning boulder weirs constructed at 30 degree angles to the banks. The banks at each end of the weirs have been heavily armored to minimize erosion of the banks.

Each weir has a downstream jump pool, shown in Attachment A. The jump pools are an innovative design used by the Coquille Watershed Association, instream work crew to provide easier access for fish during lower flows. The pools provide an extra step, which can also be used as a resting place.

Oregon Department of Fish and Wildlife (ODFW) Aquatic Habitat Inventory and Analysis Benchmarks will be used as goals for measuring the following objectives:

- Aggradation of substrates
- Reduce bank erosion by dissipating flow energy
- Increase % area of spawning gravel

***Project Tangible Benefits: North Fork Coquille (T26S, R11W, S28) Landowner – Scott Williams***

Benefits to the Williams project site include an increase in complexity and stream bed gravel and other organic accumulation. A post-project survey will be conducted this summer using the ODFW protocol to determine and compare pre and post conditions. Spawning surveys during the winter of 2007/2008 found salmonids utilizing the boulder weir substrate. Natural recruitment of woody debris has occurred from stream side vegetation falling into the stream near the boulder weirs.

***Monitoring and Evaluation***

The Coquille Watershed Association (CWA) secures grant funds from agencies such as Oregon Department of Environmental Quality and Oregon Watershed Enhancement Board to ensure continued monitoring. The CWA uses aquatic habitat inventory protocols developed by ODFW to ensure consistency of the surveys. Pre-project surveys were completed on the Hall Creek and North Fork projects prior to any disturbance. Post-project surveys will be conducted during the summer of 2008 to determine changes in substrate, gravel accumulation, pool area, etc... Water quality monitoring was completed during the summers of 2006 and 2007.

***A description and explanation of any changes to the original proposal***

No changes were made to this project. Activities were carried out according to the original proposal and schedule. The progress towards project completion was determined by the ability of the restoration crew to finish the work during the instream work period.

*Attachment A. Project Photos*

*Hall Creek - Schrader – (T29S R13W Sec 11 and 12)*



Photo taken from west side of bank (before)



Photo taken from west side of bank looking north (after).

***Snyder Wetlands Enhancement – Phase 2 Construction of off Channel Rearing  
Sections 25 & 26 of T28S, R14W, Willamette Meridian, around river mile 10***



Snyder Wetlands- Before – note white house in background as reference

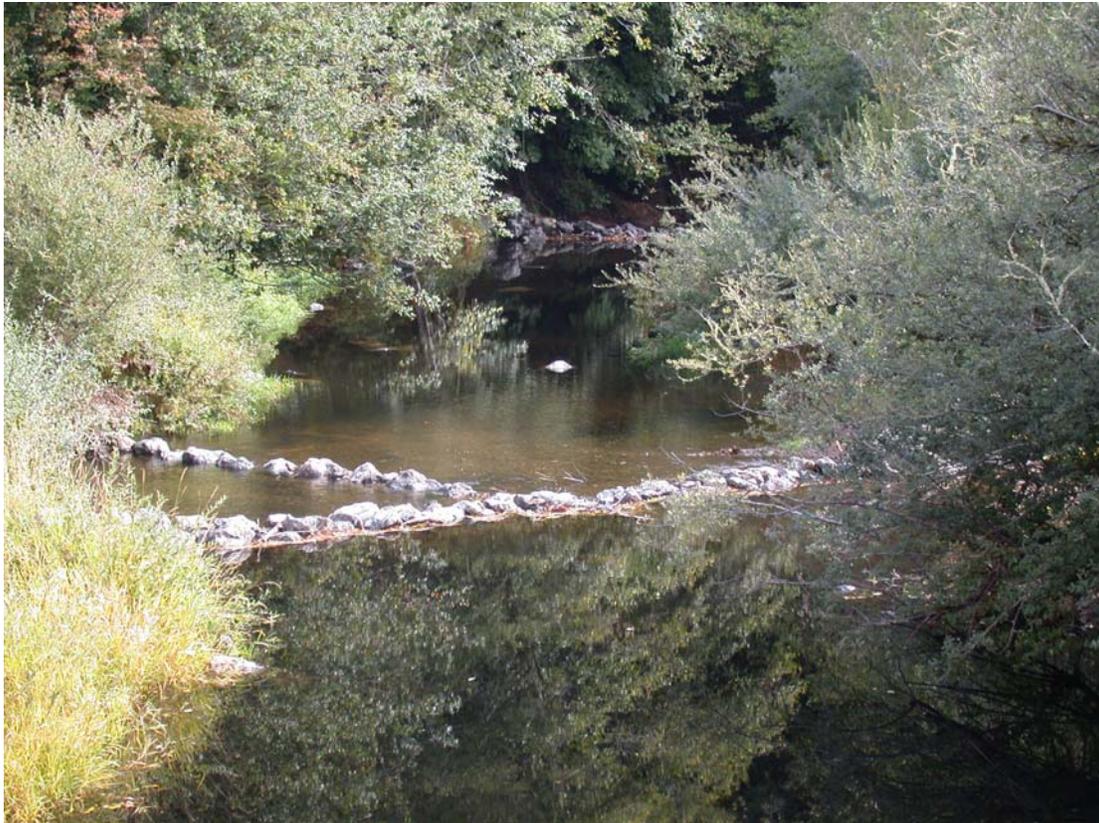


Snyder Wetlands- After Construction

*North Fork Coquille (T26S, R11W, S28) Landowner – Scott Williams*



Williams/North Fork Instream- Before Construction



Williams/North Fork Instream- After Construction