

Coos Bay Lowland Assessment and Restoration Plan

Chapter 3: Echo Sub-basin Restoration Opportunities



Echo valley. Photo CoosWA, 2004.

Table of Contents

Discussion of Restoration Opportunities.....	2
Prioritization of Potential Actions	6

Discussion of Restoration Opportunities

This section discusses the need for restoration in particular reaches (aquatic habitat survey reaches) within the sub-basin based on survey data analysis, and then introduces restoration priorities within each of four larger regions based on the prioritization scoring system.

This sub-basin is unique in that it encompasses several small streams with direct drainage to the bay, yet only Echo Creek was surveyed for this assessment. Our analysis indicates that the quality of salmon habitat in the Echo Creek varies between the five study reaches. The Beaver Pond reach and the Tidal reach are the outliers - both consisting of almost all pool units. Given the nature of the small drainage size of streams in this sub-basin and the low intrinsic potential for smolt production, restoration in the Echo sub-basin is generally a lower priority than in the other Lowland sub-basins.

Large Wood

Surveys indicate a severe lack of large wood in all reaches on Echo Creek with three out of five reaches registering zero to very negligible amounts. Large wood should be placed in the Valley, Forest, and Beaver Pond reaches and recruitment of large wood should be managed for in the Upper Forest reach. CoosWA surveyor's notes state, however, that the estimates for large wood in the Beaver Pond were possibly very low because of visibility problems and that approximately one third of the pond's surface is covered with live trees growing in the pond. As these trees die they should be kept in the pond for habitat enhancement.

Large wood can foster many of the characteristics of summer rearing habitat such as development of gravel beds, creating and increasing pool depth, and generally adding habitat complexity that serves as refugia from predators. Winter rearing characteristics can be restored by placement of large wood and boulders in the stream channel, enhancing the stream's ability to access its floodplain during high flows, and allowing channel sinuosity to form over time.

Sediment

The Echo sub-basin has high natural sediment production that is accelerated by roads, unstable banks, and other land use practices that are adversely effecting stream health and causing extensive drainage problems for local residents. Confounding the problems caused by high sediment production is the fact that the tide gates, at the lower end of three streams in the sub-basin, interrupt the natural sediment transport mechanisms and therefore, very little sediment is flushed out naturally.

Sand-silt dominated channels are expected in the lower reaches where the stream has low gradients and low water velocities. However, in this sub-basin, even the upper reaches have high amounts of silt, and all rifle sediment is far above even the undesirable amounts. The Beaver Pond reach contains 60% silt/organics.

Echo Creek has problems with bank stability and is in need of bank restoration and protection in the Valley, Forest, and Upper Forest reaches. The Valley reach also contains approximately 15% uncovered stable banks, adjacent to a county road, which should be managed to maintain its stability.

Landuse practices that disturb the erosion-prone silt/sandstone soil should be planned in a way that minimizes their impact, especially in the upper areas of the sub-basin. The slope stability analysis indicates that 27.4% of the Echo sub-basin is in the medium to extremely high risk range for naturally occurring landslides. At-risk fill at culvert sites is relatively small compared to other sub-basins.

Road and landing treatment recommendations (see Table E-10) are site-specific fixes that bring road drainage problems up to date with current, 2003, Oregon Department of Forestry Best Management Practices (BMP). Based on the Coos WA road and landing surveys, the Echo sub-basin needs 42 new ditch relief culverts to reduce road related sediment. Of the existing structures, 4 stream crossing culverts need to be replaced, 3 are rusted out

Site Type	New Structures Needed To Meet BMP	Replacement Structures Needed
Stream Crossing	18 Cross Drain Pipes	4 Culverts (3 Erosion) (1 Fish Passage)
Ditch Relief	14 Cross Drain Pipes	3 Cross Drain Pipes
Ditch Out	7 Cross Drain Pipes	4 Water Bars
Potential Landslide		
Ponding/Gullied Road Surface	3 Cross Drain Pipes	1 Water Bars
Totals	42	12

**Table E-10
Road & Landing Treatment Recommendations**

and eroding the road fill under the pipe and the 1 culvert that is listed as fish passage barrier is undersized and 20% restricted due to the crushed outlet. Three ditch relief pipes are rusted out and need replacing and 13 water bars should be cut to upgrade ditch out and gullied road surface sites. Treatment site locations are shown in Figure E-20, below.

“New structures needed” are based on Oregon Department of Forestry, 2003, Best Management Practices addressing ditch lengths. “Replacement structures needed” address all road drainage features, and are

based on the Pacific Watershed Associates Road and Landing Survey Protocol adapted by the CoosWA.

There were two stream crossing culverts that are especially undersized; they are both 48 inch culverts that drain over 1.1 square miles each. At least 100 cfs of water is backed up behind these culverts during high flow events, and each require at least 72 inch culverts to pass a 50-year event. Most of the fill at risk in this sub-basin is in the very high and high categories.

Tide gates should be maintained, redesigned or removed to allow proper flushing of sediment and upstream and downstream fish passage.

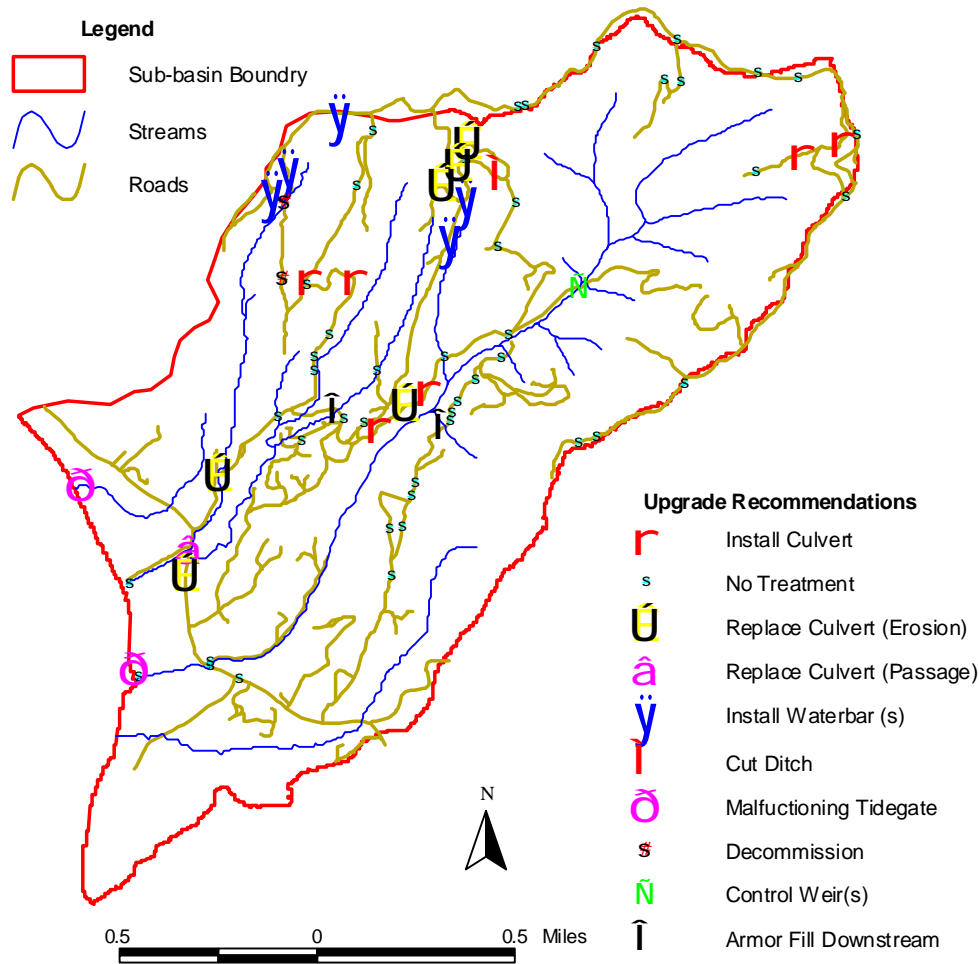


Figure E-20
Road & Landing
Treatment Recommendation
Locations

Temperature and Shade

Based on temperature data, Echo Creek appears to provide suitable summer habitat for salmonids, with only the lowest half-mile of stream showing marginal temperatures. Conservation measures should be taken to ensure continued cool temperatures.

Echo Creek has the highest current shade values compared to other sub-basins in the assessment area. Riparian shade analysis shows that there is only moderate, up to approximately 20%, lack of shade. Riparian planting, though not a priority in this sub-basin, should be considered along the Forest reach, which shows the largest need for shade and more than 10% unstable banks. Just downstream of this reach, temperatures rise into marginal levels and the stream enters the rural residential area. Care should be taken to preserve the shade that currently exists.

There are only two temperature gauging sites on Echo Creek, and assessment of the sub-basin would benefit by expanding the number and location of study sites to other streams in the sub-basin area.

Stream Flow

The Echo Creek Water Availability Basin received a low level ranking for need to restore in-stream flow for fish use. The opportunity for flow restoration received a poor ranking. Echo sub-basin was not assigned as a priority. OWEB WAM, however, ranks flow restoration opportunity based on consumptive use of >10% (OWEB, 1999). Echo Creek, in this case, is not ranked as having the greatest opportunity for flow restoration due to no change in consumptive use from 1993.

Conclusion

As demonstrated by the Limiting Factors analysis in Chapter 2, the primary habitat bottleneck in the Echo sub-basin is summer rearing habitat while landowners' primary concerns include maintenance of tide gates, drainage structures and flood control. While many of the features discussed above can be altered to augment or enhance habitat, long-term success will depend on addressing watershed processes that naturally create and sustain quality habitat. It will also be necessary to establish informed, positive working relationships between landowners order to carry out successful restoration strategies.

Prioritization of Potential Actions

Results of the prioritization process for the Echo sub-basin are mapped below in Figure E-21. Legend colors indicate how the action scored within its region and implies the general approach that CoosWA would take to the action type. A description of the prioritization process, scoring and action types is provided in Chapter 3 – Restoration Strategy.

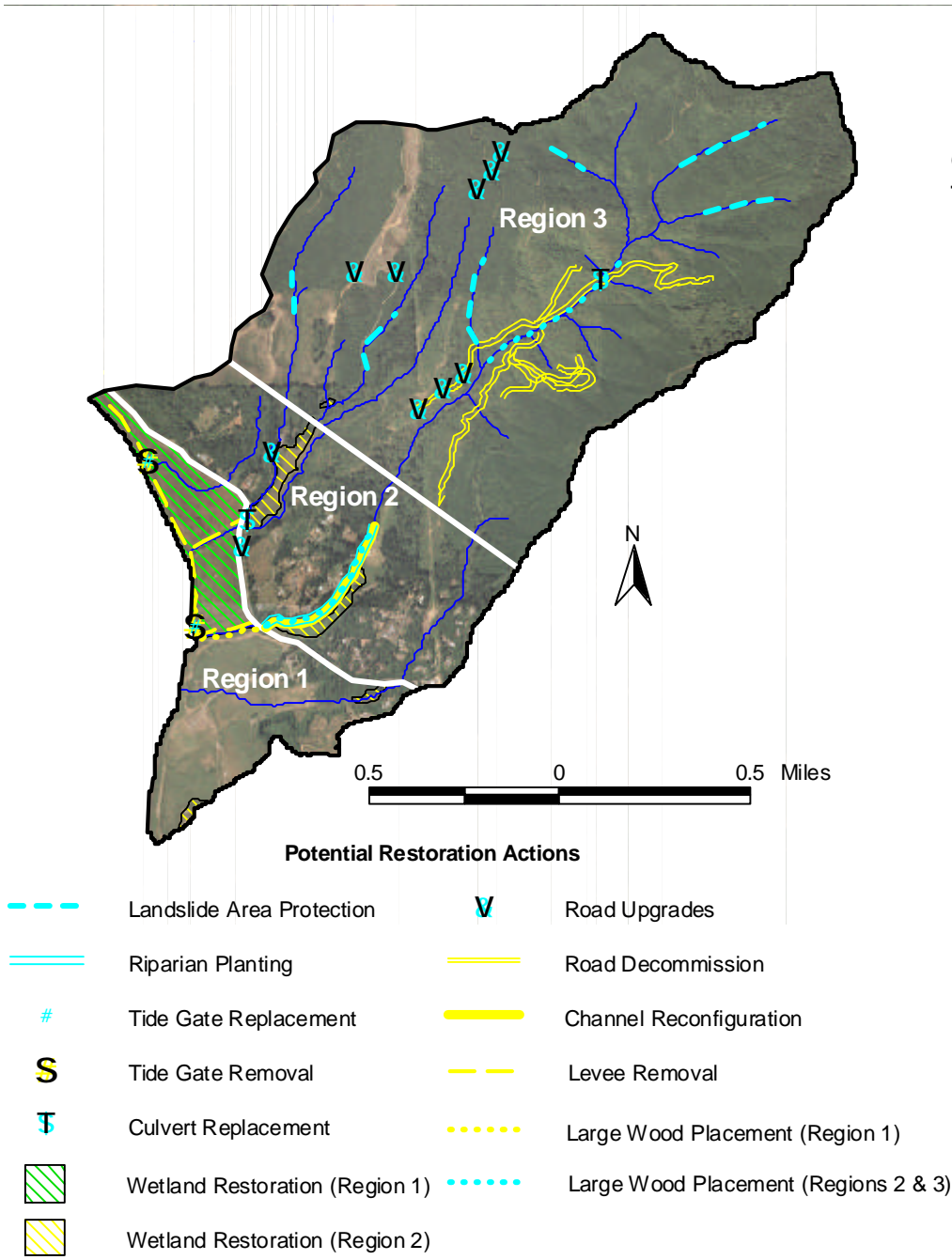


Figure E-21
Potential
Restoration
Opportunities

Region 1

Potential actions within Region 1 are listed in Table E-11 and shown in Figure E-21. As the table indicates, the only green priority level action in the Echo sub-basin is wetland restoration in Region 1. This action scored higher in this region than in Region 2 since projects affecting East Bay Drive (the need to move fill and close the road while working) and pose a significant increase in cost and implementation feasibility. Estuarine wetland restoration in Region 1 scored high for both biological returns and socio-economics. Potential actions receiving a yellow priority ranking in Region 1 include tide gate removal, tide gate relocation, levee removal and large wood placement. The yellow priority level of these actions indicates high estimated biological returns, yet lower socio-economic favorability. The blue priority level potential action of tide gate replacements received lower scores for biological returns and higher scores for socio-economics. CoosWA would provide recommendations for tide gate replacements but not take a lead on seeking funds. Potential actions in Region 1 receiving the red priority level both scored low in the biological and socio-economic criteria and are not included on the restoration opportunities map.

Region 2

Potential actions within Region 2 are listed in Table E-11 and shown in Figure E-21. Yellow priority level actions in Region 2 include reshaping the stream channel (channel reconfiguration), beaver encouragement and wetlands restoration. Blue priority level actions include large wood placement, willow wall construction, and implementation of farm plans. Neither beaver encouragement nor implementation of farm plans are shown on the map due to the impracticality of display. The red priority level actions all received low scores for both biological and socio-economic criteria and are highly unlikely to be implemented

Region 3

Potential actions within Region 3 are listed in Table E-11 and

Region	Potential Actions
1	Wetlands restoration
	Tide gate removal
	Tide gate relocation
	Levee removal (includes tide gate removal)
	Large wood placement
	Tide gate replacements
	Riparian planting
	Riparian fencing
2	Reshape channel
	Beaver encouragement
	Wetlands restoration
	Large wood placement
	Willow wall
	Implement farm plans
	Culvert replacements (passage)
	Riparian planting
	Riparian fencing
Off-channel features	
Ditch maintenance	
3	Road decommission
	Riparian forestry practices
	Large wood placement
	Culvert replacement (passage)
	Road upgrades
Landslide area protection (head wall retention)	

**Table E-11
Echo
Regions 1,
2 and 3
Potential
Actions**

shown in Figure E-21. Road decommissioning received the highest level ranking in this region, although it scored below a two for socio-economics it scored higher for biological returns. Blue priority level actions include riparian forestry practices, large wood placement, culvert replacements for fish passage, road upgrades, and landslide area protection. These actions scored higher in the socio-economic criteria and lower for biological returns. CoosWA would not take a leading role in developing funding for these projects. There were no red priority level actions in this region.