

APPENDIX K

# Capital Improvement Project (CIP) Cost Estimates

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |
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| <b>Project Name:</b> <u>Upper Brighton Creek Culvert Replacements</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Project Number:</b> <u>CIP11-BRI-C01</u> |
| <b>Project Type:</b> <u>Culvert Replacement</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Sub-Basin:</b> <u>Brighton Creek</u>     |
| <p><b>Existing Conditions:</b> A large depression in the vicinity of 4th Avenue East, 336th Street East, and Kinsman Road becomes inundated for long periods during wet season. Various flooding-related problems have been reported in the area including: (1) New culvert installed at Kinsman Road exacerbated downstream flooding (BRI-21). (2) Flooding of private property after new culvert installed at Kinsman Road (BRI-19). (3) Flooding over the roadway at 4th Avenue East, flooding of private property (BRI-18). (4) Saturated ground has degraded conditions for livestock (discussions with residents).</p> <p><b>Analysis:</b> An analysis of the drainage system found that the Kinsman Road culvert (upstream of the depression) is adequately sized to pass the 100-year discharge without overtopping Kinsman Road. A group of 4 culverts under 341st Street East (private road upstream of the depression) are not adequately sized to convey the 25-year discharge. The culvert at 8th Avenue East (private road downstream of the depression) also does not have adequate capacity to convey the 25-year discharge without overtopping the road.</p> <p><b>Project Description:</b> The Kinsman Road culvert should remain in place. The four culverts under 341st Street East should be replaced with a 10-foot by 3-foot concrete box culvert. The culvert under 8th Avenue East should be replaced with a 9-foot by 6-foot concrete box culvert. A hydrologic analysis should be completed prior to implementing the recommended culvert replacements to determine if there will be any downstream flooding effects. Available 5-foot contour data suggests that there may be a drop in bed elevation 200 to 600 feet downstream of 8th Avenue East, which should be verified with detailed survey. If so, the bed elevation of the channel could be lowered to improve drainage out of the depression. An evaluation of wetlands should also be conducted prior to implementation to determine if any habitat mitigation would be required. This project is based on field observations and existing information (e.g. 5-ft contours), therefore, prior to detailed design a survey should be conducted to confirm the assumed channel and culvert geometry (e.g. bed slope, culvert invert elevations, channel depth, and roadway elevations).</p> <p><b>Design Assumptions:</b> Hydrologic analysis pre-design study estimated at a lump sum cost of \$25,000. Wetland evaluation pre-design study estimated at a lump sum cost of \$15,000. Site survey estimated at \$10,000. Unit cost estimates are based on a review of Pierce County bid tabs, WSDOT historical unit bid costs, Utility vault estimates, and engineering judgment.</p> |                                             |

| Land Costs <sup>1</sup> |      |                   |          |      |
|-------------------------|------|-------------------|----------|------|
| Item                    | Unit | Unit Cost         | Quantity | Cost |
|                         |      |                   |          | \$ - |
|                         |      |                   |          | \$ - |
|                         |      |                   |          | \$ - |
|                         |      |                   |          | \$ - |
|                         |      |                   |          | \$ - |
|                         |      | Contingency (20%) |          | \$ - |
|                         |      | Total Land Costs  |          | \$ - |

| Construction Costs <sup>1</sup> |      |           |          |           |
|---------------------------------|------|-----------|----------|-----------|
| Item                            | Unit | Unit Cost | Quantity | Cost      |
| Hydrologic study                | LS   | \$ 25,000 | 1        | \$ 25,000 |
| Wetland evaluation              | LS   | \$ 15,000 | 1        | \$ 15,000 |
| Mobilization                    | 10%  | -         | -        | \$ 19,000 |
| Erosion and sediment control    | LS   | \$ 1,000  | 2        | \$ 2,000  |
| SPCC Plan                       | LS   | \$ 1,000  | 2        | \$ 2,000  |
| Traffic control                 | LS   | \$ 1,000  | 2        | \$ 2,000  |
| Survey                          | LS   | \$ 10,000 | 2        | \$ 20,000 |
| 9' x 6' box culvert installed   | LF   | \$ 1,600  | 40       | \$ 64,000 |
| 10' x 3' box culvert installed  | LF   | \$ 2,000  | 40       | \$ 80,000 |
| Wing walls                      | Each | \$ 2,000  | 8        | \$ 16,000 |
| Roadway reconstruction          | LS   | \$ 3,000  | 2        | \$ 6,000  |

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

**Cost/Benefit Ratio:**  
(Cost/Priority Score)

\*\* 35% for construction costs up to \$100,000  
25% for construction cost between \$100,000 - \$250,000  
20% for construction cost above \$250,000

|                        |                                      |  |                   |
|------------------------|--------------------------------------|--|-------------------|
|                        | Total                                |  | \$ 251,000        |
| * 45% habitat projects | Contingency (**%)                    |  | \$ 87,850         |
| 35% all other projects | Taxes (8.9%)                         |  | \$ 30,158         |
|                        | Sub-Total                            |  | \$ 369,008        |
|                        | Engineering and Administration (**%) |  | \$ 62,040         |
|                        | Total Land Costs                     |  | \$ -              |
|                        | Cost Escalation to 2008 (4%)         |  | \$ 17,242         |
|                        | <b>Project Cost</b>                  |  | <b>\$ 448,300</b> |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         |                                                         |             |                  |                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-------------------------|---------------------------------------------------------|-------------|------------------|-------------------|
| <b>Project Name:</b> <u>Brighton Creek Culvert Replacement (Harts Lake Loop Rd.)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                         | <b>Project Number:</b> <u>CIP11-BRI-FP01</u>            |             |                  |                   |
| <b>Project Type:</b> <u>Restoration</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                         | <b>Sub-Basin:</b> <u>Brighton Creek</u>                 |             |                  |                   |
| <b>Existing Conditions:</b> Harts Lake Loop Road, a county-owned road, crosses Brighton Creek at river mile 0.5. The 3-foot-diameter concrete culvert blocks passage to all upstream migrating salmon.                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                         |                                                         |             |                  |                   |
| <b>Analysis:</b> Pierce Conservation District analyzed the road crossing during the 2002 Nisqually basin barrier assessment and determined that it a full barrier to all salmon and steelhead. The stream below the culvert is steep, but chum and coho salmon have been seen at the culvert outlet. The culvert blocks over 4 miles of stream and 100's of acres of wetlands above the Harts Lake Loop Road.                                                                                                                                                                |             |                  |                         |                                                         |             |                  |                   |
| <b>Proposed Solution/ Project Description:</b> The proposed solution for removing the fish passage barrier at Harts Lake Loop Road is to replace the existing culvert with a 23'-0" by 11'-11" aluminum structural plate arch culvert. The stream simulation method is proposed for design of the culvert wherein it will be laid at an 8% grade and backfilled with 24" minus cobble mix. The culvert will be 160 feet long.                                                                                                                                                |             |                  |                         |                                                         |             |                  |                   |
| <b>Design Assumptions:</b> This culvert is on a 7.6% slope at the crossing of Harts Lake Loop Road. The existing culvert is a 36" concrete tube that is perched 4 feet at the outlet. The watershed area above the culvert is 2,683 acres. Winter fish flow is 33 cfs. The 2-year storm is 83 cfs and the 100-year storm is 235 cfs. Pipe velocity at fish flow is 11.3 ft/sec (4 ft/sec is the maximum recommended for this culvert). Culvert capacity is approximately 125 cfs with 20 feet of head from the invert. There is considerable capacity for ponding behind the |             |                  |                         |                                                         |             |                  |                   |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                         | <b>Construction Costs<sup>1</sup></b>                   |             |                  |                   |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>         | <b>Item</b>                                             | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Mobilization and traffic control                        | LS          | \$ 15,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Water diversion, erosion control, clearing              | LS          | \$ 6,000         | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Culvert                                                 | LS          | \$ 175,200       | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Installation of culvert                                 | LS          | \$ 46,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Excavation/backfill                                     | cy          | \$ 20            | 3,500             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Streambed material, rip rap and LWD                     | LS          | \$ 28,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Placement of material                                   | LS          | \$ 12,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Road resurfacing                                        | feet        | \$ 105           | 100               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Utility adjustment -over power and phone                | LS          | \$ 15,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Project maintenance                                     | LS          | \$ 10,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Riparian replanting and clean-up                        | acre        | \$ 10,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Permitting                                              | LS          | \$ 5,000         | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  | <b>Total</b>            |                                                         |             |                  | <b>Total</b>      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         |                                                         |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  | Contingency (20%)       |                                                         |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  | <b>Total Land Costs</b> |                                                         |             |                  | <b>\$ 400,200</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | <b>Cost/Benefit Ratio:</b>                              |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | (Cost/Priority Score)                                   |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | * 45% habitat projects                                  |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | 35% all other projects                                  |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | ** 35% for construction costs up to \$100,000           |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | 25% for construction cost between \$100,000 - \$250,000 |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | 20% for construction cost above \$250,000               |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Engineering and Administration (**%)                    |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | Cost Escalation to 2008 dollars (4%)                    |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | <b>Project Cost</b>                                     |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                         | <b>\$ 788,700</b>                                       |             |                  |                   |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      |                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------|--------------------------------------|-------------------|
| <b>Project Name:</b> <u>West Clear Lake Road Drainage Construction</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             | <b>Project Number:</b> <u>CIP11-CLR-C01</u> |                                      |                   |
| <b>Project Type:</b> <u>Culvert Construction</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             | <b>Sub-Basin:</b> <u>Clear Lake</u>         |                                      |                   |
| <b>Existing Conditions:</b> Stormwater runoff flows over West Clear Lake Road and onto the driveway of a private residence, flowing toward the house. The County's drainage database shows a ditch along West Clear Lake Road, but the ditch appears to be overgrown and may have accumulated sediment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                                             |                                      |                   |
| <b>Analysis:</b> Field observations confirmed that runoff flows over West Clear Lake Road and onto the driveway of a private residence, flowing toward the house. Examination of available topographic data (5-foot contours from the County's GIS data library) indicated that a small area (< 0.5 acres) of State Route 161 and West Clear Lake Road potentially drain toward the problem site. The peak 100-year flow rate for this drainage area was estimated to be approximately 1.5 cfs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      |                   |
| <b>Project Description:</b> Maintenance of the existing drainage ditch along the west side of West Clear Lake Road is proposed to improve conveyance (to allow stormwater runoff to flow south to the culvert that drains west toward Twenty-seven Lake). In addition, 35 lineal feet of trench drain should be installed in front of the problem site to intercept surface flows. The trench drain will be connected to the existing County drainage ditch with 25 lineal feet of 6-inch diameter pipe. The drainage ditches along the west side of State Route 161 should also be checked for sediment and debris. These proposed projects solve flooding problem CLR-01. This project is based on field observations and existing information (e.g. 5-ft contours), therefore, prior to detailed design a survey should be conducted to confirm the assumed area contributing to the flooding problem and viability (i.e. adequate grade) for connecting a pipe from the trench drain to drainage ditch. |             |                                             |                                      |                   |
| <b>Design Assumptions:</b> Cost estimates are based on a review of Pierce County bid tabs, WSDOT historical unit bid costs, Contech estimates, and engineering judgment. The site will be surveyed for 1 day to improve/verify design specifications. Trench drain assumed to be \$400 per lineal foot, installed. Storm drain (6-inch pipe) assumed to be \$400 per lineal foot, installed. Ditch maintenance assumed to be \$25 per lineal foot for approximately 1000 feet based on engineering judgment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                                             |                                      |                   |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |             |                                             |                                      |                   |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Unit</b> | <b>Unit Cost</b>                            | <b>Quantity</b>                      | <b>Cost</b>       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Total                                | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Contingency (20%)                    | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Total Land Costs                     | \$ -              |
| <b>Construction Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                                             |                                      |                   |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Unit</b> | <b>Unit Cost</b>                            | <b>Quantity</b>                      | <b>Cost</b>       |
| Mobilization                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 10%         | -                                           | -                                    | \$ 4,950          |
| Erosion and sediment control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | LS          | \$ 1,000                                    | 1                                    | \$ 1,000          |
| SPCC Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | LS          | \$ 1,000                                    | 1                                    | \$ 1,000          |
| Traffic control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | LS          | \$ 1,000                                    | 1                                    | \$ 1,000          |
| Survey                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | LS          | \$ 500                                      | 1                                    | \$ 500            |
| Trench drain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | LF          | \$ 400                                      | 35                                   | \$ 14,000         |
| 6-inch diameter storm drain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | LF          | \$ 200                                      | 25                                   | \$ 5,000          |
| Ditch maintenance and excavation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | LF          | \$ 25                                       | 1000                                 | \$ 25,000         |
| Misc. site restoration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | LS          | \$ 2,000                                    | 1                                    | \$ 2,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             |                                      | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Total                                | \$ 54,450         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Contingency (**%)                    | \$ 19,058         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Taxes (8.9%)                         | \$ 6,542          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Sub-Total                            | \$ 80,050         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Engineering and Administration (**%) | \$ 28,017         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | Total Land Costs                     | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             |                                             | <b>Project Cost</b>                  | <b>\$ 108,100</b> |

  

|                                       |          |
|---------------------------------------|----------|
| <b>Project Prioritization Summary</b> |          |
| Flood Hazard Reduction                |          |
| Water Quality Improvement             |          |
| Natural Resource Protection           |          |
| Other Factors                         |          |
| <b>Total Score</b>                    | <b>0</b> |

  

|                                                                                                                                                       |                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cost/Benefit Ratio:</b><br>(Cost/Priority Score)                                                                                                   | * 45% habitat projects<br>35% all other projects                                                                                           |
| ** 35% for construction costs up to \$100,000<br>25% for construction cost between \$100,000 - \$250,000<br>20% for construction cost above \$250,000 | Total<br>Contingency (**%)<br>Taxes (8.9%)<br>Sub-Total<br>Engineering and Administration (**%)<br>Total Land Costs<br><b>Project Cost</b> |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             |                                         |             |                  |                                      |                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-------------------|---------------------------------------------|-----------------------------------------|-------------|------------------|--------------------------------------|-------------------|
| <b>Project Name:</b> <u>364th Street East Culvert Replacement</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | <b>Project Number:</b> <u>CIP11-HRN-C01</u> |                                         |             |                  |                                      |                   |
| <b>Project Type:</b> <u>Culvert Replacement</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   | <b>Sub-Basin:</b> <u>Horn Creek</u>         |                                         |             |                  |                                      |                   |
| <p><b>Existing Conditions:</b> This problem area is relatively flat, but surrounded by a large, steep drainage basin. There is a 12" concrete culvert under 8th Ave South and another 12" concrete culvert under 364th Street East. To the east of this intersection, there is a culvert under a private driveway. The hydraulic analyses show that the ditches along 364th Street, west of the culverts, are slightly undersized for larger, infrequent flow events. The analyses also show that all three 12" culverts in the area do not have sufficient capacity to convey the runoff from the 25-year design event.</p> <p><b>Analysis:</b> The drainage basin was delineated in GIS using 5-ft contour data. Land use was estimated using aerial photography and tax parcel information. Discharges were calculated using WWHM3 for the 2-, 5-, 10-, 25-, and 100-year storm events. The 25-year event was then modeled in HY-8.0 to determine sizing for the passage under 364th Street East. The existing 12" culvert was found to be undersized. The ditches were analyzed using Manning's Equation and were found to convey the 25-year event.</p> <p><b>Project Description:</b> The 12-inch culvert at the intersection of 364th Street East should be replaced with an 11-foot wide by 3-foot high, 3-sided concrete box culvert to convey the 100-year flow. The 12-inch culvert at 8th Ave South should be replaced with a 3-foot wide by 2-foot high concrete box culvert to pass the 100-year flow rate. The culvert to the east of the intersection also requires a 3-foot wide by 2-foot high concrete box culvert in order to pass the 100-year event; however, the purpose of this culvert is unclear because there is no road or driveway at that location. The area downstream of the culvert under 364th Street East should be cleared. This project is based on field observations and existing information (e.g. 5-ft contours), therefore, prior to detailed design a survey should be conducted to confirm the assumed channel and culvert geometry (e.g. bed slope, culvert invert elevations, channel depth, and roadway elevations).</p> <p><b>Design Assumptions:</b> One day of survey will be required before project construction to improve/verify design. Ditch maintenance cost is included in the 'Misc. site restoration' line item. The driveway culvert is not replaced as part of this project until it is decided upon by the County. Box culverts are proposed due to limited ground cover.</p> |             |                  |                   |                                             |                                         |             |                  |                                      |                   |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | <b>Construction Costs<sup>1</sup></b>       |                                         |             |                  |                                      |                   |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   | <b>Cost</b>                                 | <b>Item</b>                             | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>                      | <b>Cost</b>       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   | \$ -                                        | Mobilization                            | 10%         | -                | -                                    | \$ 20,170         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   | \$ -                                        | Erosion and sediment control            | LS          | \$ 1,000         | 1                                    | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   | \$ -                                        | SPCC Plan                               | LS          | \$ 1,000         | 1                                    | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   | \$ -                                        | Traffic control                         | LS          | \$ 1,000         | 1                                    | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   | \$ -                                        | Survey                                  | LS          | \$ 500           | 3                                    | \$ 1,500          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  | Total             | \$ -                                        | 11' x 3' concrete box culvert installed | LF          | \$ 2,200         | 52                                   | \$ 114,400        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  | Contingency (20%) | \$ -                                        | 3' x 2' concrete box culvert installed  | LF          | \$ 800           | 40                                   | \$ 32,000         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  | Total Land Costs  | \$ -                                        | 3' x 2' concrete box culvert installed  | LF          | \$ 800           | 46                                   | \$ 36,800         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             | Wing walls                              | Each        | \$ 2,000         | 4                                    | \$ 8,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             | Misc. site restoration                  | LS          | \$ 2,000         | 3                                    | \$ 6,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             |                                         |             |                  |                                      |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             | Total                                   |             |                  |                                      | \$ 221,870        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             | * 45% habitat projects                  |             |                  | Contingency (**%)                    | \$ 77,655         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             | 35% all other projects                  |             |                  | Taxes (8.9%)                         | \$ 26,658         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             |                                         |             |                  | Sub-Total                            | \$ 326,182        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             |                                         |             |                  | Engineering and Administration (**%) | \$ 65,236         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             |                                         |             |                  | Cost Escalation to 2008 (4%)         | \$ 19,829         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             |                                         |             |                  | Total Land Costs                     | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                             |                                         |             |                  | <b>Project Cost</b>                  | <b>\$ 411,300</b> |

  

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

  

|                                                     |                                                                                                                                                                |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cost/Benefit Ratio:</b><br>(Cost/Priority Score) | <p>** 35% for construction costs up to \$100,000<br/>25% for construction cost between \$100,000 - \$250,000<br/>20% for construction cost above \$250,000</p> |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  |                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-------------------|----------------------------------------------|-------------|------------------|-------------------|
| <b>Project Name:</b> <u>Horn Creek Barrier Removal (waterfall at RM 1.0)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | <b>Project Number:</b> <u>CIP11-HRN-FP01</u> |             |                  |                   |
| <b>Project Type:</b> <u>Restoration</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   | <b>Sub-Basin:</b> <u>Horn Creek</u>          |             |                  |                   |
| <p><b>Existing Conditions:</b> A man-made waterfall at river mile 1.0 severely limits upstream migration of salmon. Minor alterations have been made to the waterfall to allow some limited upstream migration, but most salmon species still do not migrate above this barrier.</p> <p><b>Analysis:</b> Pierce Conservation District analyzed the waterfall during the 2002 Nisqually basin barrier assessment and determined that it is a partial barrier. The estimated 4-foot drop excludes large numbers of chum salmon, which have been observed to stack up at this barrier.</p> <p><b>Proposed Solution/ Project Description:</b> The project will create a bypass cascade to the east of the waterfall. This will be built with a series of 18" to 24" log and rock weirs.</p> <p><b>Design Assumptions:</b> The landowner will not agree to full removal of waterfall.</p> |             |                  |                   |                                              |             |                  |                   |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | <b>Construction Costs<sup>1</sup></b>        |             |                  |                   |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   | <b>Item</b>                                  | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Mobilization                                 | LS          | \$ 10,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Water diversion                              | LS          | \$ 2,433         | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Clearing and grubbing                        | acre        | \$ 3,042         | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Erosion control                              | LS          | \$ 2,433         | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Channel excavation plus haul                 | cy          | \$ 12            | 500               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Streambed material plus rocks                | tons        | \$ 25            | 104               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Large wood debris plus delivery              | each        | \$ 850           | 12                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Placement of material                        | cy          | \$ 15            | 104               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Project maintenance                          | LS          | \$ 10,000        | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Riparian replanting                          | acre        | \$ 10,000        | 0.5               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   | Permitting                                   | LS          | \$ 5,000         | 1                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  | Total             |                                              |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  | Contingency (20%) |                                              |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  | Total Land Costs  |                                              |             |                  |                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | \$ 56,847         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | \$ 25,581         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | \$ 7,336          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | \$ 89,764         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | \$ 31,417         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | \$ 4,847          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                              |             |                  | <b>\$ 126,100</b> |

  

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

  

|                                                                                                                                                       |                                                  |                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cost/Benefit Ratio:</b><br>(Cost/Priority Score)                                                                                                   | * 45% habitat projects<br>35% all other projects | Total<br>Contingency (**%)<br>Taxes (8.9%)<br>Sub-Total<br>Engineering and Administration (**%)<br>Total Land Costs<br>Cost Escalation to 2008 dollars (4%)<br><b>Project Cost</b> |
| ** 35% for construction costs up to \$100,000<br>25% for construction cost between \$100,000 - \$250,000<br>20% for construction cost above \$250,000 |                                                  | \$ 56,847<br>\$ 25,581<br>\$ 7,336<br>\$ 89,764<br>\$ 31,417<br>\$ -<br>\$ 4,847<br><b>\$ 126,100</b>                                                                              |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                                              |                                              |
|------------------------------------------------------------------------------|----------------------------------------------|
| <b>Project Name:</b> <u>Horn Creek Barrier Removal (Harts Lake Loop Rd.)</u> | <b>Project Number:</b> <u>CIP11-HRN-FP02</u> |
| <b>Project Type:</b> <u>Restoration</u>                                      | <b>Sub-Basin:</b> <u>Horn Creek</u>          |

**Existing Conditions:** Harts Lake Loop Road, a county-owned road, crosses Horn Creek at river mile 1.2. The 4-foot-diameter concrete culvert poses a passage problem to upstream migrating salmon.

**Analysis:** Pierce Conservation District analyzed the road crossing during the 2002 Nisqually basin barrier assessment and determined that it a partial barrier and only 33% passable. The barrier excludes salmon from over 1.5 miles of salmon spawning and rearing habitat.

**Proposed Solution/ Project Description:** The project will replace a concrete culvert with a 19-foot by 6-foot 4-inch aluminum bottomless arch culvert with 2 feet of cover.

**Design Assumptions:** Complete detour for Harts Lake Loop Road for several days to replace the culvert. No utilities in road fill and no adjustment of the approach.

| Land Costs <sup>1</sup> |      |           |          |                   | Construction Costs <sup>1</sup>            |      |           |          |           |                                      |                   |
|-------------------------|------|-----------|----------|-------------------|--------------------------------------------|------|-----------|----------|-----------|--------------------------------------|-------------------|
| Item                    | Unit | Unit Cost | Quantity | Cost              | Item                                       | Unit | Unit Cost | Quantity | Cost      |                                      |                   |
|                         |      |           |          | \$ -              | Mobilization and traffic control           | LS   | \$ 15,000 | 1        | \$ 15,000 |                                      |                   |
|                         |      |           |          | \$ -              | Water diversion, erosion control, clearing | LS   | \$ 6,000  | 1        | \$ 6,000  |                                      |                   |
|                         |      |           |          | \$ -              | Culvert                                    | LS   | \$ 34,000 | 1        | \$ 34,000 |                                      |                   |
|                         |      |           |          | \$ -              | Installation of culvert                    | LS   | \$ 26,000 | 1        | \$ 26,000 |                                      |                   |
|                         |      |           |          | \$ -              | Excavation/backfill                        | cy   | \$ 20     | 500      | \$ 10,000 |                                      |                   |
|                         |      |           |          | \$ -              | Streambed material and rip rap             | LS   | \$ 6,000  | 1        | \$ 6,000  |                                      |                   |
|                         |      |           |          | \$ -              | Large wood debris plus delivery            | each | \$ 850    | 6        | \$ 5,100  |                                      |                   |
|                         |      |           |          | \$ -              | Placement of material                      | LS   | \$ 2,000  | 1        | \$ 2,000  |                                      |                   |
|                         |      |           |          | \$ -              | Road resurfacing                           | feet | \$ 90     | 150      | \$ 13,500 |                                      |                   |
|                         |      |           |          | \$ -              | Project maintenance                        | LS   | \$ 10,000 | 1        | \$ 10,000 |                                      |                   |
|                         |      |           |          | \$ -              | Riparian replanting                        | acre | \$ 10,000 | 1        | \$ 5,000  |                                      |                   |
|                         |      |           |          | \$ -              | Permitting                                 | LS   | \$ 5,000  | 1        | \$ 5,000  |                                      |                   |
| Total                   |      |           |          | \$ -              |                                            |      |           |          | Total     | \$ 137,600                           |                   |
|                         |      |           |          | Contingency (20%) | \$ -                                       |      |           |          |           | Contingency (**%)                    | \$ 61,920         |
|                         |      |           |          | Total Land Costs  | \$ -                                       |      |           |          |           | Taxes (8.9%)                         | \$ 17,757         |
|                         |      |           |          |                   |                                            |      |           |          |           | Sub-Total                            | \$ 217,277        |
|                         |      |           |          |                   |                                            |      |           |          |           | Engineering and Administration (**%) | \$ 54,319         |
|                         |      |           |          |                   |                                            |      |           |          |           | Total Land Costs                     | \$ -              |
|                         |      |           |          |                   |                                            |      |           |          |           | Cost Escalation to 2008 dollars (4%) | \$ 10,864         |
|                         |      |           |          |                   |                                            |      |           |          |           | <b>Project Cost</b>                  | <b>\$ 282,500</b> |

  

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

**Cost/Benefit Ratio:**  
(Cost/Priority Score)

\* 45% habitat projects  
35% all other projects

\*\* 35% for construction costs up to \$100,000  
25% for construction cost between \$100,000 - \$250,000  
20% for construction cost above \$250,000

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.





|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             |                                      |             |                  |                 |                   |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-------------------|---------------------------------------------|--------------------------------------|-------------|------------------|-----------------|-------------------|-----------|
| <b>Project Name:</b> <u>Dean Kreger Road Culvert Replacement</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                  |                   | <b>Project Number:</b> <u>CIP11-KRG-C02</u> |                                      |             |                  |                 |                   |           |
| <b>Project Type:</b> <u>Culvert Replacement and Ditch Armoring</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |                  |                   | <b>Sub-Basin:</b> <u>Kreger Creek</u>       |                                      |             |                  |                 |                   |           |
| <p><b>Existing Conditions:</b> Flooding of Dean Kreger Road is caused from two undersized culverts under the road that are both 12" diameter concrete pipes. The discharges from these culverts are large drops of close to 10' that has created channel incision and erosion along the channels that cross private property. There are also two more culverts that pass flow under a private driveway and out to a wetland. Both driveway culverts are adequately sized.</p> <p><b>Analysis:</b> The drainage basin was delineated in GIS using 5-ft contour data. Land use was estimated using aerial photography and tax parcel information. Discharges were calculated using WWHM3 for the 2-, 5-, 10-, 25-, and 100-year storm events. The 100-year event was then modeled in HY-8.0 to determine sizing for the passage under Dean Kreger Road and the channel dimensions to pass the 100-yr flow through the private property and out to the wetland.</p> <p><b>Project Description:</b> A pre-design study is recommended to further evaluate the hydrology and downstream wetland to ensure all recommendations are adequate to prevent future problems. Based on preliminary analysis, it is recommended that the two culverts under Dean Kreger Road should be replaced with a 24" CMP culvert (southern crossing) and 18" CMP culvert (northern crossing) to convey the 100-year flow. Culverts were sized based on the 100-yr discharge and not fish passage due to the nature of the steep terrain in the channels. The existing two culverts under the driveway are adequately sized and do not need replacing. The channels that convey water from Dean Kreger Road to the wetland should be sized to a bottom width of 2-ft, side slope of 2:1, and a height of 1.5-ft. This channel allows for 1-ft of freeboard during the 100-yr event. The channels should be armored, or use grade control structures to protect from erosion and channel degradation. Armoring has been assumed for cost-estimating purposes. The eroded slopes downstream of Dean Kreger Road should be regarded and stabilized. Energy dissipaters are recommended at the discharge point from the channels to the wetland to prevent erosion from occurring in the wetland.</p> <p><b>Design Assumptions:</b> Cost estimates are based on a review of Pierce County bid tabs, WSDOT historical unit bid costs, Utility vault estimates, and engineering judgment. Two days of survey will be required before project construction to improve/verify design. Channel armoring cost include landscape restoration of 5 feet on either side of the channel. Armoring costs assumes a channel that is 2' bottom width, 2:1 side slope, and 1.5' in depth.</p> |             |                  |                   |                                             |                                      |             |                  |                 |                   |           |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | <b>Construction Costs<sup>1</sup></b>       |                                      |             |                  |                 |                   |           |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   | <b>Cost</b>                                 | <b>Item</b>                          | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b> | <b>Cost</b>       |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   | \$ -                                        | Mobilization                         | 10%         | -                | -               | \$ 14,020         |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   | \$ -                                        | Erosion and sediment control         | LS          | \$ 1,000         | 1               | \$ 1,000          |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   | \$ -                                        | SPCC Plan                            | LS          | \$ 1,000         | 1               | \$ 1,000          |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   | \$ -                                        | Traffic control                      | LS          | \$ 1,000         | 1               | \$ 1,000          |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   | \$ -                                        | Survey                               | LS          | \$ 500           | 2               | \$ 1,000          |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  | Total             | \$ -                                        | 24" Corrugated Metal Pipe Installed  | LF          | \$ 115           | 30              | \$ 3,450          |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  | Contingency (20%) | \$ -                                        | 18" Corrugated Metal Pipe Installed  | LF          | \$ 85            | 30              | \$ 2,550          |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  | Total Land Costs  | \$ -                                        | Channel Armoring                     | LF          | \$ 95            | 560             | \$ 53,200         |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Energy Dissipaters                   | Each        | \$ 2,500         | 2               | \$ 5,000          |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Re-grading and Slope Stabilization   | LS          | \$ 50,000        | 1               | \$ 50,000         |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Pre-Design Study                     | LS          | \$ 20,000        | 1               | \$ 20,000         |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Misc. site restoration               | LS          | \$ 2,000         | 1               | \$ 2,000          |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Total                                |             |                  |                 | \$ 154,220        |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | * 45% habitat projects               |             |                  |                 | Contingency (**%) | \$ 53,977 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | 35% all other projects               |             |                  |                 | Taxes (8.9%)      | \$ 18,530 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Sub-Total                            |             |                  |                 | \$ 226,727        |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Engineering and Administration (**%) |             |                  |                 | \$ 45,345         |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Cost Escalation to 2008 (4%)         |             |                  |                 | \$ 13,783         |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | Total Land Costs                     |             |                  |                 | \$ -              |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                             | <b>Project Cost</b>                  |             |                  |                 | <b>\$ 285,900</b> |           |

  

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

  

|                                                     |                                                                                                                                                       |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cost/Benefit Ratio:</b><br>(Cost/Priority Score) | ** 35% for construction costs up to \$100,000<br>25% for construction cost between \$100,000 - \$250,000<br>20% for construction cost above \$250,000 |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                     |                                     |
|-----------------------------------------------------|-------------------------------------|
| <b>Project Name:</b> Tisch Road Culvert Replacement | <b>Project Number:</b> CIP11MUR-C01 |
| <b>Project Type:</b> Culvert Replacement            | <b>Sub-Basin:</b> Murray Creek      |

**Existing Conditions:** Roadway flooding was reported along Tisch Road South near 324th Street South. A drainage ditch flows from south to north along Tisch Road South and then crosses under Tisch Road through a 12-inch CMP culvert. Roadway flooding was observed on the upstream side of the culvert and in the upstream ditch along the road. During a site visit on May 16, 2007, it was noted that the channels are overgrown with vegetation.

**Analysis:** The drainage basin was delineated in GIS using 5-ft contour data. Land use was estimated using aerial photography and tax parcel information. Discharges were calculated using WWHM3 for the 2-, 5-, 10-, 25-, and 100-year storm events. The area draining to this ditch and culvert was estimated to be about 185 acres. The drainage is mostly flat with mixed pasture, forest and rural residential land use. The 100-year flow rate was estimated to be 29 cfs.

**Project Description:** The analyses show that a 3-sided, 10-foot wide by 3-foot high concrete box culvert would convey the 100-year design event. The proposed culvert also provides fish passage per WDFW's "Stream Simulation" design methodology. The box culvert is used to account for limited cover. This project is based on field observations and existing information (e.g. 5-ft contours), therefore, prior to detailed design a survey should be conducted to confirm the assumed channel and culvert geometry (e.g. bed slope, culvert invert elevations, channel depth, and roadway elevations).

**Design Assumptions:** Cost estimates are based on a review of Pierce County bid tabs, WSDOT historical unit bid costs, Contech estimates, and engineering judgment. The site will be surveyed for 1 day to improve/verify design specifications. The project is within the right-of-way and will not require acquisition of additional land.

| Land Costs <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |           |                   |      | Construction Costs <sup>1</sup>                                                                                                                                |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------|----------|---------------------------|--|-----------------------------|--|---------------|--|--------------------|----------|----------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Unit     | Unit Cost | Quantity          | Cost | Item                                                                                                                                                           | Unit | Unit Cost              | Quantity | Cost                      |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   | \$ - | Mobilization                                                                                                                                                   | 10%  | -                      | -        | \$ 11,411                 |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   | \$ - | Erosion and sediment control                                                                                                                                   | LS   | \$ 1,000               | 1        | \$ 1,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   | \$ - | SPCC Plan                                                                                                                                                      | LS   | \$ 1,000               | 1        | \$ 1,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   | \$ - | Traffic control                                                                                                                                                | LS   | \$ 1,000               | 1        | \$ 1,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   | \$ - | Survey                                                                                                                                                         | LS   | \$ 500                 | 1        | \$ 500                    |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           | Total             | \$ - | 10' x 3' concrete box culvert installed                                                                                                                        | LF   | \$ 2,000               | 50       | \$ 100,000                |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           | Contingency (20%) | \$ - | Wing walls                                                                                                                                                     | Each | \$ 2,000               | 4        | \$ 8,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           | Total Land Costs  | \$ - | Trash rack                                                                                                                                                     | Each | \$ 305                 | 2        | \$ 610                    |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      | Misc. site restoration                                                                                                                                         | LS   | \$ 2,000               | 1        | \$ 2,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      |                                                                                                                                                                |      |                        |          | \$ -                      |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      |                                                                                                                                                                |      |                        |          | \$ -                      |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      |                                                                                                                                                                |      |                        | Total    | \$ 125,521                |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Project Prioritization Summary</th> </tr> </thead> <tbody> <tr> <td>Flood Hazard Reduction</td> <td></td> </tr> <tr> <td>Water Quality Improvement</td> <td></td> </tr> <tr> <td>Natural Resource Protection</td> <td></td> </tr> <tr> <td>Other Factors</td> <td></td> </tr> <tr> <td style="text-align: right;"><b>Total Score</b></td> <td style="text-align: center;"><b>0</b></td> </tr> </tbody> </table> |          |           |                   |      | Project Prioritization Summary                                                                                                                                 |      | Flood Hazard Reduction |          | Water Quality Improvement |  | Natural Resource Protection |  | Other Factors |  | <b>Total Score</b> | <b>0</b> | <p><b>Cost/Benefit Ratio:</b><br/>(Cost/Priority Score)</p> <p>* 45% habitat projects<br/>35% all other projects</p> |  | <p>Contingency (**%) \$ 43,932</p> <p>Taxes (8.9%) \$ 15,081</p> <p>Sub-Total \$ 184,535</p> <p>Engineering and Administration (**%) \$ 46,134</p> <p>Total Land Costs \$ -</p> <p><b>Project Cost \$ 230,700</b></p> |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      | Project Prioritization Summary                                                                                                                                 |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      | Flood Hazard Reduction                                                                                                                                         |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      | Water Quality Improvement                                                                                                                                      |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      | Natural Resource Protection                                                                                                                                    |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
| Other Factors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |           |                   |      |                                                                                                                                                                |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
| <b>Total Score</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>0</b> |           |                   |      |                                                                                                                                                                |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      | <p>** 35% for construction costs up to \$100,000<br/>25% for construction cost between \$100,000 - \$250,000<br/>20% for construction cost above \$250,000</p> |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      |                                                                                                                                                                |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |           |                   |      |                                                                                                                                                                |      |                        |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                                                       |  |  |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

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| <b>Project Name:</b> 365th Street East Culvert Replacement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   | <b>Project Number:</b> CIP11-TWL-C01          |                                    |             |                  |                 |             |
| <b>Project Type:</b> Culvert Replacement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | <b>Sub-Basin:</b> Lower Tanwax                |                                    |             |                  |                 |             |
| <p><b>Existing Conditions:</b> Flooding over the roadway was reported at 365th Street East near Weyerhaeuser Elementary School. A drainage ditch flowing from north to south drains an area of approximately 315 acres of mixed forest, pasture and rural residential land use. Culvert appears to have some damage at the inlet.</p> <p><b>Analysis:</b> The drainage basin was delineated in GIS using 5-ft contour data. Land use was estimated using aerial photography and tax parcel information. Discharges were calculated using WWHM3 for the 2-, 5-, 10-, 25-, and 100-year storm events. The 25-year event was then modeled in HY-8.0 to determine capacity of the culvert under Webster Drive. The 25-year flow rate was calculated to be 25 cfs. The existing 18-inch concrete culvert does not have adequate capacity to convey the 25-year. FEQUTL was used to size a new culvert for hydraulic capacity and fish passage.</p> <p><b>Project Description:</b> Replace the existing 18-inch culvert with a 3-sided concrete box culvert, 7-foot wide by 4-foot high to convey the 100-year flow rate and provide the necessary geometry for fish passage. The top of the box culvert is assumed to be set at the elevation of the existing roadway with no cover to address depth and cover limitations. This project is based on field observations and existing information (e.g. 5-ft contours), therefore, prior to detailed design a survey should be conducted to confirm the assumed channel and culvert geometry (e.g. bed slope, culvert invert elevations, channel depth, and roadway elevations).</p> <p><b>Design Assumptions:</b> Cost estimates are based on a review of Pierce County bid tabs, WSDOT historical unit bid costs, Contech estimates, and engineering judgment. The site will be surveyed for 1 day to improve/verify design specifications. Assumed cost of trash racks is \$800 per inlet/outlet. The project is within the right-of-way and will not require acquisition of additional land.</p> |             |                  |                   |                                               |                                    |             |                  |                 |             |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |                  |                   | <b>Construction Costs<sup>1</sup></b>         |                                    |             |                  |                 |             |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   | <b>Cost</b>                                   | <b>Item</b>                        | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b> | <b>Cost</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ -                                          | Mobilization                       | 10%         | -                | -               | \$ 7,860    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ -                                          | Erosion and sediment control       | LS          | \$ 1,000         | 1               | \$ 1,000    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ -                                          | SPCC Plan                          | LS          | \$ 1,000         | 1               | \$ 1,000    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ -                                          | Traffic control                    | LS          | \$ 1,000         | 1               | \$ 1,000    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ -                                          | 7' x 4' concrete box culvert inst. | Each        | \$ 1,500         | 40              | \$ 60,000   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  | Total             | \$ -                                          | Wing walls                         | Each        | \$ 2,000         | 4               | \$ 8,000    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  | Contingency (20%) | \$ -                                          | Trash rack                         | Each        | \$ 800           | 2               | \$ 1,600    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  | Total Land Costs  | \$ -                                          | Misc. site restoration             | LS          | \$ 6,000         | 1               | \$ 6,000    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   |                                               |                                    |             |                  |                 | \$ -        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   |                                               |                                    |             |                  |                 | \$ -        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   |                                               |                                    |             |                  |                 | \$ -        |
| <b>Project Prioritization Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |                  |                   |                                               |                                    |             |                  |                 |             |
| Flood Hazard Reduction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   |                                               |                                    |             |                  |                 |             |
| Water Quality Improvement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                               |                                    |             |                  |                 |             |
| Natural Resource Protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                  |                   |                                               |                                    |             |                  |                 |             |
| Other Factors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |                  |                   |                                               |                                    |             |                  |                 |             |
| <b>Total Score</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |             | <b>0</b>         |                   |                                               |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | <b>Cost/Benefit Ratio:</b>                    |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | (Cost/Priority Score)                         |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | * 45% habitat projects      Contingency (**%) |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | 35% all other projects      Taxes (8.9%)      |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | Sub-Total                                     |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ 127,109                                    |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | Engineering and Administration (**%)          |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ 44,488                                     |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | Cost Escalation to 2008 (4%)                  |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ 8,490                                      |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | Total Land Costs                              |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | \$ -                                          |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | <b>Project Cost</b>                           |                                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | <b>\$ 180,100</b>                             |                                    |             |                  |                 |             |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                               |                                               |
|---------------------------------------------------------------|-----------------------------------------------|
| <b>Project Name:</b> <u>Lower Tanwax Riparian Enhancement</u> | <b>Project Number:</b> <u>CIP11-TWL-RST01</u> |
| <b>Project Type:</b> <u>Restoration</u>                       | <b>Sub-Basin:</b> <u>Lower Tanwax Creek</u>   |

**Existing Conditions:** The lower Tanwax Creek flows for 4.5 miles through a 98-acre riparian wetland that has been cleared and now consists of small shrubs and large amounts of reed canary grass. The reduced amount of large wood in the creek and the loss of streamside and overhanging vegetation have had numerous impacts. The lack of riparian vegetation available to provide shade has likely led to higher peak summer water temperatures throughout the subbasin, reducing the productivity of juvenile coho and steelhead that rear in the creek. The loss of streamside vegetation is also associated with reduced nutrient input to the creek, opportunities for fish concealment, and shade to prevent the growth

**Analysis:** The Tribe has identified this wetland as the number two priority for wetland restoration in a 1996 inventory of commercial forestry land owned wetlands. Now it is owned by several dozen private landowners.

**Proposed Solution/ Project Description** Streamside vegetation plantings in selected reed canary grass dominated areas and along the creek between RM 1.75 and RM 3.5.

**Design Assumptions:** We are assuming only 78 acres of the 98-acre wetland can be re-planted due to wetland conditions. The majority will be live stakes (85%) and some (15%) bareroot plants. Density is 1,000 livestakes per acre plus 200 potted plants. Contingency was reduced to 35%, and cost escalation was increased to 8% due to 3-year length of project.

| Land Costs <sup>1</sup> |      |           |                   |      | Construction Costs <sup>1</sup> |        |           |          |            |
|-------------------------|------|-----------|-------------------|------|---------------------------------|--------|-----------|----------|------------|
| Item                    | Unit | Unit Cost | Quantity          | Cost | Item                            | Unit   | Unit Cost | Quantity | Cost       |
|                         |      |           |                   | \$ - | Mobilization                    | LS     | \$ 7,500  | 1        | \$ 7,500   |
|                         |      |           |                   | \$ - | Riparian plants (live stakes)   | each   | \$ 1      | 78,000   | \$ 66,300  |
|                         |      |           |                   | \$ - | Riparian plants (potted)        | each   | \$ 4      | 15,600   | \$ 54,600  |
|                         |      |           |                   | \$ - | Installation                    | hours  | \$ 18     | 1,664    | \$ 29,120  |
|                         |      |           |                   | \$ - | Site prep                       | acre   | \$ 1,500  | 78       | \$ 117,000 |
|                         |      |           |                   | \$ - | Incidentals                     | acre   | \$ 250    | 78       | \$ 19,500  |
|                         |      |           |                   | \$ - | Project maintenance             | 3 year | \$ 1,200  | 78       | \$ 93,600  |
|                         |      |           | Total             | \$ - |                                 |        |           |          |            |
|                         |      |           | Contingency (20%) | \$ - |                                 |        |           |          |            |
|                         |      |           | Total Land Costs  | \$ - |                                 |        |           |          |            |

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

|                                                     |                                                             |
|-----------------------------------------------------|-------------------------------------------------------------|
| <b>Cost/Benefit Ratio:</b><br>(Cost/Priority Score) | Total \$ 387,620                                            |
|                                                     | Contingency (**%) \$ 135,667                                |
|                                                     | Taxes (8.9%) \$ 46,573                                      |
|                                                     | Sub-Total \$ 569,860                                        |
|                                                     | Engineering and Administration (**%) \$ 113,972             |
|                                                     | Total Land Costs \$ -                                       |
|                                                     | Cost Escalation to 2008 through 2010 dollars (8%) \$ 54,707 |
|                                                     | <b>Project Cost \$ 738,600</b>                              |

\*\* 35% for construction costs up to \$100,000  
 25% for construction cost between \$100,000 - \$250,000  
 20% for construction cost above \$250,000

\* 45% habitat projects  
 35% all other projects

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.







|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   |                                             |                                        |             |                  |                 |                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-------------------|---------------------------------------------|----------------------------------------|-------------|------------------|-----------------|-------------------|
| <b>Project Name:</b> <u>Webster Road Culvert Replacement</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |                  |                   | <b>Project Number:</b> <u>CIP11-TWU-C02</u> |                                        |             |                  |                 |                   |
| <b>Project Type:</b> <u>Culvert Repair and Channel Excavation</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   | <b>Sub-Basin:</b> <u>Upper Tanwax</u>       |                                        |             |                  |                 |                   |
| <p><b>Existing Conditions:</b> Roadway flooding was reported at Webster Road near the intersection with State Route 161. Field observations noted that the culvert under Webster Road, approximately 1200 feet northwest of State Route 161, is damaged at the inlet. The 18-inch CMP culvert is bent at the inlet in a way that is an obvious hindrance to conveyance. It was noted during a site visit that the cover over the culvert does not meet the minimum 2-foot requirement. The culvert also had rusted along the bottom, which may indicate standing water for a long period of time. Local residents suggested that there are beavers in the area and that they may have contributed to backups.</p> <p><b>Analysis:</b> The drainage basin was delineated in GIS using 5-ft contour data. Land use was estimated using aerial photography and tax parcel informaton. Discharges were calculated using WWHM3 for the 2-, 5-, 10-, 25-, and 100-year storm events. The 25-year event was then modeled in HY-8.0 to determine capacity of the culvert under Webster Drive. FEQUTL was used for proposed culvert sizing. Manning's analysis on the surrounding channels showed that they were adequately sized as well.</p> <p><b>Project Description:</b> Since the culvert is damaged and rusted, it should be replaced. A 5-foot wide by 3-foot high concrete box culvert would adequately convey the 100-year flow rate without a submerged inlet. Limitations in cover are addressed by the top of the box culvert assumed to set at the existing roadway grade. The box culvert design meets WDFW requirements for fish passage using the "Stream Simulation" methodology. It is also recommended that the 12-inch culvert to the east be removed or repaired and cleaned out. This project is based on field observations and existing information (e.g. 5-ft contours), therefore, prior to detailed design a survey should be conducted to confirm the assumed channel and culvert geometry (e.g. bed slope, culvert invert elevations, channel depth, and roadway elevations).</p> <p><b>Design Assumptions:</b> Cost of ditch maintenance and cleanout of the 12" driveway culvert is including in the 'Misc. site restoration' line item. No survey is required because the project is small. This project will be constructed within the right-of-way and will not require acquisition of additional land.</p> |             |                  |                   |                                             |                                        |             |                  |                 |                   |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | <b>Construction Costs<sup>1</sup></b>       |                                        |             |                  |                 |                   |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   | <b>Cost</b>                                 | <b>Item</b>                            | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b> | <b>Cost</b>       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | \$ -                                        | Mobilization                           | 10%         | -                | -               | \$ 5,960          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | \$ -                                        | Erosion and sediment control           | LS          | \$ 1,000         | 1               | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | \$ -                                        | SPCC Plan                              | LS          | \$ 1,000         | 1               | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | \$ -                                        | Traffic control                        | LS          | \$ 1,000         | 1               | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | \$ -                                        | 5' x 3' concrete box culvert installed | Each        | \$ 1,000         | 45              | \$ 45,000         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  | Total             | \$ -                                        | Wing walls                             | Each        | \$ 2,000         | 4               | \$ 8,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  | Contingency (20%) | \$ -                                        | Trash rack                             | Each        | \$ 800           | 2               | \$ 1,600          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  | Total Land Costs  | \$ -                                        | Misc. site restoration                 | LS          | \$ 2,000         | 1               | \$ 2,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   |                                             |                                        |             |                  |                 | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   |                                             |                                        |             |                  |                 | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   |                                             |                                        |             |                  |                 | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | Total                                       |                                        |             |                  |                 | \$ 65,560         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | Contingency (**%)                           |                                        |             |                  |                 | \$ 22,946         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | Taxes (8.9%)                                |                                        |             |                  |                 | \$ 7,877          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | Sub-Total                                   |                                        |             |                  |                 | \$ 96,383         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | Engineering and Administration (**%)        |                                        |             |                  |                 | \$ 33,734         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | Cost Escalation to 2008 (4%)                |                                        |             |                  |                 | \$ 6,438          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | Total Land Costs                            |                                        |             |                  |                 | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                  |                   | <b>Project Cost</b>                         |                                        |             |                  |                 | <b>\$ 136,600</b> |

  

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

  

|                                                                                                                                                                                                                            |                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <p><b>Cost/Benefit Ratio:</b><br/>(Cost/Priority Score)</p> <p>** 35% for construction costs up to \$100,000<br/>25% for construction cost between \$100,000 - \$250,000<br/>20% for construction cost above \$250,000</p> | <p>* 45% habitat projects<br/>35% all other projects</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                             |                                             |
|-------------------------------------------------------------|---------------------------------------------|
| <b>Project Name:</b> <u>Thomas Road Culvert Replacement</u> | <b>Project Number:</b> <u>CIP11-TWU-C04</u> |
| <b>Project Type:</b> <u>Culvert Replacement</u>             | <b>Sub-Basin:</b> <u>Upper Tanwax</u>       |

**Existing Conditions:** Roadway flooding problems leading to flooding of private property were reported near 34328 Thomas Road East. A property owner reported frequent flooding of the roadway and overflow of ditches, which causes runoff to wash out the road and flow into the dwelling. Residents also reported that the drainage ditches have not been adequately maintained. Field observations noted that construction and improper sediment control could be causing sediment build up in ditches and conveyance structures.

**Analysis:** The drainage basin was delineated in GIS using 5-ft contour data. Land use was estimated using aerial photography and tax parcel information. Discharges were calculated using WWHM3 for the 2-, 5-, 10-, 25-, and 100-year storm events. The 25-year event was then modeled in HY-8.0 to determine capacity of culvert under Thomas Road East. The culvert was found to be undersized. The ditches along Thomas Road were analyzed using Manning's Equation and found to be adequately sized.

**Project Description:** Maintenance should be conducted at the site to clean out sediment and debris buildup in conveyance structures. It is recommended that the 12-inch culvert be replaced with a 3-sided concrete box culvert, 6-foot wide by 5-foot high to allow for conveyance of the 100-year flow rate and provide the necessary geometry for fish passage. The top of the box culvert is assumed to be set at the elevation of the existing roadway with no cover. Field survey and detailed hydraulic analyses should be performed before project implementation. Inlet conditions at the storm drain downstream of the culvert should be inspected to ensure proper capture of flow. This project is based on field observations and existing information (e.g. 5-ft contours), therefore, prior to detailed design a survey should be conducted to confirm the assumed channel and culvert geometry (e.g. bed slope, culvert invert elevations, channel depth, and roadway elevations).

**Design Assumptions:** Cost estimates are based on a review of Pierce County bid tabs, WSDOT historical unit bid costs, Contech estimates, and engineering judgment. The site will be surveyed for 1 day to improve/verify design specifications. The project is within the right-of-way and will not require acquisition of additional land.

| Land Costs <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |           |                   |      | Construction Costs <sup>1</sup>        |      |                                                         |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-------------------|------|----------------------------------------|------|---------------------------------------------------------|----------|---------------------------|--|-----------------------------|--|---------------|--|--------------------|----------|----------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Unit     | Unit Cost | Quantity          | Cost | Item                                   | Unit | Unit Cost                                               | Quantity | Cost                      |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   | \$ - | Mobilization                           | 10%  | -                                                       | -        | \$ 9,010                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   | \$ - | Erosion and sediment control           | LS   | \$ 1,000                                                | 1        | \$ 1,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   | \$ - | SPCC Plan                              | LS   | \$ 1,000                                                | 1        | \$ 1,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   | \$ - | Traffic control                        | LS   | \$ 1,000                                                | 1        | \$ 1,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   | \$ - | Survey                                 | LS   | \$ 500                                                  | 1        | \$ 500                    |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           | Total             | \$ - | 6' x 5' concrete box culvert installed | LF   | \$ 1,500                                                | 50       | \$ 75,000                 |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           | Contingency (20%) | \$ - | Wing walls                             | Each | \$ 2,000                                                | 4        | \$ 8,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           | Total Land Costs  | \$ - | Trash rack                             | Each | \$ 800                                                  | 2        | \$ 1,600                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      | Misc. site restoration                 | LS   | \$ 2,000                                                | 1        | \$ 2,000                  |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      |                                        |      |                                                         |          | \$ -                      |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      |                                        |      |                                                         |          | \$ -                      |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      |                                        |      |                                                         | Total    | \$ 99,110                 |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Project Prioritization Summary</th> </tr> </thead> <tbody> <tr> <td style="width:80%;">Flood Hazard Reduction</td> <td style="width:20%;"></td> </tr> <tr> <td>Water Quality Improvement</td> <td></td> </tr> <tr> <td>Natural Resource Protection</td> <td></td> </tr> <tr> <td>Other Factors</td> <td></td> </tr> <tr> <td style="text-align: right;"><b>Total Score</b></td> <td style="text-align: center;"><b>0</b></td> </tr> </tbody> </table> |          |           |                   |      | Project Prioritization Summary         |      | Flood Hazard Reduction                                  |          | Water Quality Improvement |  | Natural Resource Protection |  | Other Factors |  | <b>Total Score</b> | <b>0</b> | <p><b>Cost/Benefit Ratio:</b><br/>(Cost/Priority Score)</p> <p>* 45% habitat projects<br/>35% all other projects</p> |  | <p>Taxes (8.9%) \$ 11,908</p> <p>Sub-Total \$ 145,707</p> <p>Engineering and Administration (**%) \$ 50,997</p> <p>Total Land Costs \$ -</p> <p><b>Project Cost \$ 196,800</b></p> |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      | Project Prioritization Summary         |      |                                                         |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      | Flood Hazard Reduction                 |      |                                                         |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      | Water Quality Improvement              |      |                                                         |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      | Natural Resource Protection            |      |                                                         |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
| Other Factors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |          |           |                   |      |                                        |      |                                                         |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
| <b>Total Score</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>0</b> |           |                   |      |                                        |      |                                                         |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      |                                        |      | ** 35% for construction costs up to \$100,000           |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      |                                        |      | 25% for construction cost between \$100,000 - \$250,000 |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      |                                        |      | 20% for construction cost above \$250,000               |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |           |                   |      |                                        |      |                                                         |          |                           |  |                             |  |               |  |                    |          |                                                                                                                      |  |                                                                                                                                                                                    |  |  |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.









|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   |                                                         |                                        |             |                  |                 |             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-------------------|---------------------------------------------------------|----------------------------------------|-------------|------------------|-----------------|-------------|
| <b>Project Name:</b> <u>Lower Ohop Valley Restoration Phase 1 (Segements D, E, and F)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   | <b>Project Number:</b> <u>CIP14-OHL-RST01</u>           |                                        |             |                  |                 |             |
| <b>Project Type:</b> <u>Restoration</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   | <b>Sub-Basin:</b> <u>Lower Ohop Creek</u>               |                                        |             |                  |                 |             |
| <p><b>Existing Conditions:</b> Ohop Creek is the second largest Nisqually tributary below LaGrande Dam. It is an area of historic agricultural use that is being converted to rural residential use. The area has undergone many changes that have resulted in the decline of salmon productivity. Channel confinement modifications such as ditching and channelization have occurred. There has been a decline in the amount of key habitat and habitat diversity, including loss of large woods, streamside vegetation, pools, and riffle habitat. These factors have led to reduced channel stability, increased summer stream temperatures, increased fine sediment levels, and reduced food availability. There has also been an increase in</p> <p><b>Analysis:</b> Assessments and analyses have identified several alternatives for restoration. The full restoration alternative has been selected as the preferred alternative.</p> <p><b>Proposed Solution/ Project Description</b> The project will re-elevate the 4.0 miles of severely channelized creek back into its original floodplain, recreating a 5.2- mile-long stream. The creek's original meander pattern and its connection to the adjacent floodplain and wetland areas will be restored. The project will also re-vegetate approximately 490 acres of the surrounding valley floor, which is dominated by wetlands. Due to the large size of the project, it is split into three phases (1, 2, and 3). This first phase will restore approximately 1 mile of creek and will be the pilot project to the other phases. It focuses on the Land Trust properties, around Highway 7, which are visible to the tens of thousands of travelers to Mount Rainier National Park every year. It will be the demonstration project for the remaining phases.</p> <p><b>Design Assumptions:</b> Design assumptions include excavation of 1.05 miles of new creek channel, filling ~0.5 miles of old channel, replanting 92 acres of the valley floor, and installing 7 pieces of large wood per 100 feet of new channel. Mobilization (10%), incidentals (10%), and contingency (20%) have been included in the line items. Engineering and Administration are estimated at 25%.</p> |             |                  |                   |                                                         |                                        |             |                  |                 |             |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |                  |                   | <b>Construction Costs<sup>1</sup></b>                   |                                        |             |                  |                 |             |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   | <b>Cost</b>                                             | <b>Item</b>                            | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b> | <b>Cost</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ -                                                    | Channel reconnection                   | LS          | \$ 551,146       | 1               | \$ 551,146  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ -                                                    | Large woody debris (inc. installation) | LS          | \$ 483,277       | 1               | \$ 483,277  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ -                                                    | Dike removal                           | LS          | \$ 40,957        | 1               | \$ 40,957   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ -                                                    | Off-channel habitat creation           | LS          | \$ 42,000        | 1               | \$ 42,000   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ -                                                    | Plant removal and salvage              | LS          | \$ 62,580        | 1               | \$ 62,580   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  | Total             | \$ -                                                    | Plant installation                     | LS          | \$ 155,494       | 1               | \$ 155,494  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  | Contingency (20%) | \$ -                                                    | Plant material                         | LS          | \$ 273,000       | 1               | \$ 273,000  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  | Total Land Costs  | \$ -                                                    | Roughened channel                      | LS          | \$ 98,000        | 1               | \$ 98,000   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   |                                                         | Site maintenance                       | LS          | \$ 198,800       | 1               | \$ 198,800  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   |                                                         |                                        |             |                  |                 | \$ -        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   |                                                         |                                        |             |                  |                 | \$ -        |
| <b>Project Prioritization Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |                  |                   |                                                         |                                        |             |                  |                 |             |
| Flood Hazard Reduction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |                  |                   |                                                         |                                        |             |                  |                 |             |
| Water Quality Improvement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                                         |                                        |             |                  |                 |             |
| Natural Resource Protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                                         |                                        |             |                  |                 |             |
| Other Factors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |                  |                   |                                                         |                                        |             |                  |                 |             |
| <b>Total Score</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             | <b>0</b>         |                   |                                                         |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | <b>Cost/Benefit Ratio:</b>                              |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | (Cost/Priority Score)                                   |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | * 45% habitat projects                                  |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | 35% all other projects                                  |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | ** 35% for construction costs up to \$100,000           |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | 25% for construction cost between \$100,000 - \$250,000 |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | 20% for construction cost above \$250,000               |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | Total                                                   |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ 1,905,254                                            |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | Contingency (**%)                                       |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | already incl.                                           |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | Taxes (8.9%)                                            |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ 169,568                                              |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | Sub-Total                                               |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ 2,074,821                                            |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | Engineering and Administration (**%)                    |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ 518,705                                              |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | Total Land Costs                                        |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ -                                                    |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | Cost Escalation to 2008 dollars (4%)                    |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | \$ 103,741                                              |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | <b>Total Project Cost</b>                               |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | <b>\$ 2,697,300</b>                                     |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | <b>Project Cost (15% County share)</b>                  |                                        |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |                  |                   | <b>\$ 404,595</b>                                       |                                        |             |                  |                 |             |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

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| <b>Project Name:</b> <u>Lower Ohop Valley Restoration Phase 2 (Segments A, B, and C)</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                           |                             |                    | <b>Project Number:</b> <u>CIP14-OHL-RST02</u>                                                                                                                                                                              |                                                          |             |                  |                 |                                                                                                                                                                                                                                                                                                                                                         |
| <b>Project Type:</b> <u>Restoration</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                             |                    | <b>Sub-Basin:</b> <u>Lower Ohop Creek</u>                                                                                                                                                                                  |                                                          |             |                  |                 |                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>Existing Conditions:</b> Ohop Creek is the second largest Nisqually tributary below LaGrande Dam. It is an area of historic agricultural use that is being converted to rural residential use. The area has undergone many changes that have led to the decline of salmon productivity. Channel confinement modifications such as ditching and channelization have occurred. There has been a decline in the amount of key habitat and habitat diversity, including loss of large woods, streamside vegetation, pools, and riffle habitat. These factors have led to reduced channel stability, increased summer stream temperatures, increased fine sediment levels, and reduced food availability. There has also been an increase in</p> <p><b>Analysis:</b> Assessments and analyses have identified several alternatives for restoration. The full restoration alternative has been selected as the preferred alternative.</p> <p><b>Proposed Solution/ Project Description:</b> The project will re-elevate the 4.0 miles of severely channelized creek back into its original floodplain, recreating a 5.2- mile-long stream. The creek's original meander pattern and its connection to the adjacent floodplain and wetland areas will be restored. The project will also re-vegetate approximately 490 acres of the surrounding valley floor, which is dominated by wetlands. Due to the large size of the project, it is split into three phases (1, 2, and 3). This second phase will restore approximately 2.1 miles of creek and includes reforestation of 110 acres of floodplain forest. This phase will connect the first phase of the project to the mouth of the creek and therefore will make both projects even more effective by providing 3.1 miles of uninterrupted restored habitat.</p> <p><b>Design Assumptions:</b> Design assumptions include excavating 2.1 miles of new creek channel, filling 1.1 miles of old channel, replanting 110 acres of the valley floor, and installing 7 pieces of large wood per 100 feet of new channel. Mobilization (10%), incidentals (10%), and contingency (20%) have been included in the line items. Engineering and Administration are estimated at 25%.</p> |                           |                             |                    |                                                                                                                                                                                                                            |                                                          |             |                  |                 |                                                                                                                                                                                                                                                                                                                                                         |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                             |                    | <b>Construction Costs<sup>1</sup></b>                                                                                                                                                                                      |                                                          |             |                  |                 |                                                                                                                                                                                                                                                                                                                                                         |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Unit</b>               | <b>Unit Cost</b>            | <b>Quantity</b>    | <b>Cost</b>                                                                                                                                                                                                                | <b>Item</b>                                              | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b> | <b>Cost</b>                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             |                    | \$ -                                                                                                                                                                                                                       | Channel reconn                                           | LS          | \$ 943,327       | 1               | \$ 943,327                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             |                    | \$ -                                                                                                                                                                                                                       | Wood delivery and placement                              | LS          | \$ 737,990       | 1               | \$ 737,990                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             |                    | \$ -                                                                                                                                                                                                                       | Plant removal and salvage                                | LS          | \$ 42,242        | 1               | \$ 42,242                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             |                    | \$ -                                                                                                                                                                                                                       | Plant installation                                       | LS          | \$ 450,982       | 1               | \$ 450,982                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             |                    | \$ -                                                                                                                                                                                                                       | Plant material                                           | LS          | \$ 528,000       | 1               | \$ 528,000                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             | Total              | \$ -                                                                                                                                                                                                                       | Site maintenance                                         | LS          | \$ 154,000       | 1               | \$ 154,000                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             | Contingency (20%)  | \$ -                                                                                                                                                                                                                       |                                                          |             |                  |                 | \$ -                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             | Total Land Costs   | \$ -                                                                                                                                                                                                                       |                                                          |             |                  |                 | \$ -                                                                                                                                                                                                                                                                                                                                                    |
| <b>Project Prioritization Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                           |                             |                    |                                                                                                                                                                                                                            |                                                          |             |                  |                 |                                                                                                                                                                                                                                                                                                                                                         |
| Flood Hazard Reduction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Water Quality Improvement | Natural Resource Protection | Other Factors      |                                                                                                                                                                                                                            |                                                          |             |                  |                 |                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             | <b>Total Score</b> | <b>0</b>                                                                                                                                                                                                                   |                                                          |             |                  |                 |                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                             |                    | <p><b>Cost/Benefit Ratio:</b><br/>(Cost/Priority Score)</p> <p>** 35% for construction costs up to \$100,000<br/>25% for construction cost between \$100,000 - \$250,000<br/>20% for construction cost above \$250,000</p> | <p>* 45% habitat projects<br/>35% all other projects</p> |             |                  |                 | <p>Total \$ 2,856,541<br/>Contingency (**%) already incl.<br/>Taxes (8.9%) \$ 254,232<br/>Sub-Total \$ 3,110,773<br/>Engineering and Administration (**%) \$ 777,693<br/>Total Land Costs \$ -<br/>Cost Escalation to 2008 dollars (4%) \$ 155,539<br/><b>Total Project Cost \$ 4,044,100</b><br/><b>Project Cost (15% County share) \$ 606,600</b></p> |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.







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| <b>Project Name:</b> <u>Culvert Replacement at 278th Avenue East</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                  |                   | <b>Project Number:</b> <u>CIP19-ASH-C01</u> |                                |             |                  |                 |                   |
| <b>Project Type:</b> <u>Culvert Replacement</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | <b>Sub-Basin:</b> <u>Ashford Reach</u>      |                                |             |                  |                 |                   |
| <p><b>Existing Conditions:</b> There are two parallel culverts that convey the Ashford Reach under 278th Avenue East. One is a 48" diameter CMP and the other is a 24" diameter CMP. A large drainage area (approximately 1,200 acres) drains to this crossing.</p> <p><b>Analysis:</b> The drainage basin was delineated in GIS using 5-ft contour data. Land use was estimated using aerial photography. Discharges were calculated using WWHM. The 100-year flow was estimated at 810 cfs, the 25-year flow was estimated at 510 cfs, and the 5-year flow was estimated at approximately 265 cfs.</p> <p><b>Project Description:</b> The streambed should be cleared of the large boulders at the outlets and an energy dissipation device and channel stabilization are considered for the culvert inlets. Replace two existing culverts with a single 12' wide by 5' high concrete box to convey the 5-year discharge. It is also recommended that a trash rack be added to reduce the amount of vegetation blocking the culvert inlet. Project solves flooding problems ASH-01 and ASH-02. This project is based on field observations and existing information (e.g. 5-ft contours), therefore, prior to detailed design a survey should be conducted to confirm the assumed channel and culvert geometry (e.g. bed slope, culvert invert elevations, channel depth, and roadway elevations).</p> <p><b>Design Assumptions:</b> Cost estimates are based on a review of Pierce County bid tabs, WSDOT historical unit bid costs, utility vault estimates, and engineering judgment. The site will be surveyed for 1 day to improve/verify design specifications. The project is within the right-of-way and will not require acquisition of additional land.</p> |             |                  |                   |                                             |                                |             |                  |                 |                   |
| <b>Land Costs<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |                  |                   | <b>Construction Costs<sup>1</sup></b>       |                                |             |                  |                 |                   |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   | <b>Cost</b>                                 | <b>Item</b>                    | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b> | <b>Cost</b>       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | \$ -                                        | Mobilization                   | 10%         | -                | -               | \$ 14,250         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | \$ -                                        | Erosion and sediment control   | LS          | \$ 1,000         | 1               | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | \$ -                                        | SPCC Plan                      | LS          | \$ 1,000         | 1               | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | \$ -                                        | Traffic control                | LS          | \$ 1,000         | 1               | \$ 1,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | \$ -                                        | Survey                         | LS          | \$ 500           | 1               | \$ 500            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  | Total             | \$ -                                        | 12' x 5' box culvert installed | LF          | \$ 2,500         | 50              | \$ 125,000        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  | Contingency (20%) | \$ -                                        | Wing walls                     | Each        | \$ 2,000         | 4               | \$ 8,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  | Total Land Costs  | \$ -                                        | Energy dissipation/trash rack  | Each        | \$ 2,000         | 2               | \$ 4,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   |                                             | Misc. site restoration         | LS          | \$ 2,000         | \$ 1            | \$ 2,000          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   |                                             |                                |             |                  |                 | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   |                                             |                                |             |                  |                 | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | Total                                       |                                |             |                  |                 | \$ 156,750        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | Contingency (**%)                           |                                |             |                  |                 | \$ 54,863         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | Taxes (8.9%)                                |                                |             |                  |                 | \$ 18,834         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | Sub-Total                                   |                                |             |                  |                 | \$ 230,446        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | Engineering and Administration (**%)        |                                |             |                  |                 | \$ 57,612         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | Total Land Costs                            |                                |             |                  |                 | \$ -              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | <b>Project Cost</b>                         |                                |             |                  |                 | <b>\$ 288,100</b> |

  

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

  

|                                                                                                                                                                                                                            |                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <p><b>Cost/Benefit Ratio:</b><br/>(Cost/Priority Score)</p> <p>** 35% for construction costs up to \$100,000<br/>25% for construction cost between \$100,000 - \$250,000<br/>20% for construction cost above \$250,000</p> | <p>* 45% habitat projects<br/>35% all other projects</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.



| <b>Project Name:</b> <u>Mashel Shoreline Buffer Acquisition</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            |                         | <b>Project Number:</b> <u>CIP20-MAL-AC02</u> |                                 |      |                                                         |                                      |      |                   |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|-------------------------|----------------------------------------------|---------------------------------|------|---------------------------------------------------------|--------------------------------------|------|-------------------|------|
| <b>Project Type:</b> <u>Protection</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |            |                         | <b>Sub-Basin:</b> <u>Lower Mashel River</u>  |                                 |      |                                                         |                                      |      |                   |      |
| <p><b>Existing Conditions:</b> Major habitat alternations have occurred in the Mashel subbasin. Encroachment on the river by development has affected the most productive section of the river through Eatonville. There has been a decrease in the number of large fallen trees in the creek. Many of the side-channels have been eliminated and overhanging vegetation has been removed, including standing trees that would have provided a source of large wood and shade. Removal of the trees has produced an excess of fine sediment inputs from increased soil erosion. Channelization of the Mashel River has also occurred in many areas. A few areas have not been affected by the encroachment and therefore need to be</p> <p><b>Analysis:</b> The EDT model results show that protection of functioning habitat within this reach would highly benefit Nisqually salmon and steelhead and would greatly aid recovery of threatened species.</p> <p><b>Proposed Solution/ Project Description</b> Purchase 1 mile of the Mashel River shoreline in Eatonville. Seek strategic properties for protection and restoration purposes.</p> <p><b>Design Assumptions:</b> Purchase properties totaling 61 acres near Eatonville. The cost of undeveloped land in the area is estimated at about \$7000/acre. One developed 5-acre parcel could be acquired.</p> |       |            |                         |                                              |                                 |      |                                                         |                                      |      |                   |      |
| Land Costs <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |            |                         |                                              | Construction Costs <sup>1</sup> |      |                                                         |                                      |      |                   |      |
| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Unit  | Unit Cost  | Quantity                | Cost                                         | Item                            | Unit | Unit Cost                                               | Quantity                             | Cost |                   |      |
| Land Acquisition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | acres | \$ 7,000   | 61                      | \$ 427,000                                   |                                 |      |                                                         |                                      | \$ - |                   |      |
| Stewardship plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | acres | \$ 500     | 66                      | \$ 33,000                                    |                                 |      |                                                         |                                      | \$ - |                   |      |
| Developed property                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LS    | \$ 220,000 | 1                       | \$ 220,000                                   |                                 |      |                                                         |                                      | \$ - |                   |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            |                         | \$ -                                         |                                 |      |                                                         |                                      | \$ - |                   |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            |                         | \$ -                                         |                                 |      |                                                         |                                      | \$ - |                   |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            |                         | \$ -                                         |                                 |      |                                                         |                                      | \$ - |                   |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            |                         | \$ -                                         |                                 |      |                                                         |                                      | \$ - |                   |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            | Total                   | \$ 680,000                                   |                                 |      |                                                         |                                      | \$ - |                   |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            | Contingency (20%)       | \$ 136,000                                   |                                 |      |                                                         |                                      |      |                   |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            | <b>Total Land Costs</b> | <b>\$ 816,000</b>                            |                                 |      |                                                         |                                      |      |                   |      |
| Project Prioritization Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |            |                         |                                              |                                 |      |                                                         |                                      |      |                   |      |
| Flood Hazard Reduction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |            |                         |                                              | Cost/Benefit Ratio:             |      |                                                         |                                      |      | Total             | \$ - |
| Water Quality Improvement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |            |                         |                                              | (Cost/Priority Score)           |      | * 45% habitat projects                                  | Contingency (**%)                    |      | \$ -              |      |
| Natural Resource Protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |            |                         |                                              |                                 |      | 35% all other projects                                  | Taxes (8.9%)                         |      | \$ -              |      |
| Other Factors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |            |                         |                                              |                                 |      | Sub-Total                                               |                                      | \$ - |                   |      |
| <b>Total Score</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       | <b>0</b>   |                         |                                              |                                 |      | Engineering and Administration (**%)                    | Total Land Costs                     |      | \$ 816,000        |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            |                         |                                              |                                 |      | 25% for construction costs up to \$100,000              | Cost Escalation to 2008 dollars (4%) |      | \$ 32,640         |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            |                         |                                              |                                 |      | 20% for construction cost between \$100,000 - \$250,000 | <b>Project Cost</b>                  |      | <b>\$ 848,700</b> |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |            |                         |                                              |                                 |      | 20% for construction cost above \$250,000               |                                      |      |                   |      |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                                 |                                              |
|-----------------------------------------------------------------|----------------------------------------------|
| <b>Project Name:</b> <u>Mashel Small Properties Acquisition</u> | <b>Project Number:</b> <u>CIP20-MAL-AC03</u> |
| <b>Project Type:</b> <u>Protection</u>                          | <b>Sub-Basin:</b> <u>Lower Mashel River</u>  |

**Existing Conditions:** Major habitat alterations have occurred in the Mashel subbasin. Encroachment on the river by development has affected the most productive section of the river through Eatonville. There has been a decrease in the number of large fallen trees in the creek. Many of the side-channels have been eliminated and overhanging vegetation has been removed, including standing trees that would have provided a source of large wood and shade. Removal of the trees has produced an excess of fine sediment inputs from increased soil erosion. Channelization of the Mashel River has also occurred in many areas. A few areas have not been affected by the encroachment and therefore need to be

**Analysis:** The EDT model results show that protection of functioning habitat within this reach would highly benefit Nisqually salmon and steelhead and would greatly aid recovery of threatened species.

**Proposed Solution/ Project Description** Acquire available properties along the Mashel River. Since smaller properties enter and leave the real estate market fairly quickly, it is important to be able to react to those opportunities with these funds. A similar fund that was focused on small properties along the Nisqually River has been very successful in acquiring critical small parcels.

**Design Assumptions:** 80 acres of undeveloped land along the Mashel river.

| Land Costs <sup>1</sup>               |       |           |                   |            | Construction Costs <sup>1</sup>                         |      |                                      |          |      |
|---------------------------------------|-------|-----------|-------------------|------------|---------------------------------------------------------|------|--------------------------------------|----------|------|
| Item                                  | Unit  | Unit Cost | Quantity          | Cost       | Item                                                    | Unit | Unit Cost                            | Quantity | Cost |
| Land Acquisition                      | acres | \$ 5,000  | 80                | \$ 400,000 |                                                         |      |                                      |          | \$ - |
| Stewardship plan                      | acres | \$ 1,000  | 80                | \$ 80,000  |                                                         |      |                                      |          | \$ - |
| Landowner outreach                    | LS    | \$ 15,000 | 1                 | \$ 15,000  |                                                         |      |                                      |          | \$ - |
|                                       |       |           |                   | \$ -       |                                                         |      |                                      |          | \$ - |
|                                       |       |           |                   | \$ -       |                                                         |      |                                      |          | \$ - |
|                                       |       |           |                   | \$ -       |                                                         |      |                                      |          | \$ - |
|                                       |       |           |                   | \$ -       |                                                         |      |                                      |          | \$ - |
|                                       |       |           | Total             | \$ 495,000 |                                                         |      |                                      |          | \$ - |
|                                       |       |           | Contingency (20%) | \$ 99,000  |                                                         |      |                                      |          |      |
|                                       |       |           | Total Land Costs  | \$ 594,000 |                                                         |      |                                      |          |      |
| <b>Project Prioritization Summary</b> |       |           |                   |            |                                                         |      |                                      |          |      |
| Flood Hazard Reduction                |       |           |                   |            | <b>Cost/Benefit Ratio:</b>                              |      | Total                                |          |      |
| Water Quality Improvement             |       |           |                   |            | (Cost/Priority Score)                                   |      | Contingency (**%)                    |          |      |
| Natural Resource Protection           |       |           |                   |            |                                                         |      | Taxes (8.9%)                         |          |      |
| Other Factors                         |       |           |                   |            |                                                         |      | Sub-Total                            |          |      |
| <b>Total Score</b>                    |       | <b>0</b>  |                   |            |                                                         |      | Engineering and Administration (**%) |          |      |
|                                       |       |           |                   |            | ** 35% for construction costs up to \$100,000           |      | Total Land Costs                     |          |      |
|                                       |       |           |                   |            | 25% for construction cost between \$100,000 - \$250,000 |      | \$ 594,000                           |          |      |
|                                       |       |           |                   |            | 20% for construction cost above \$250,000               |      | Cost Escalation to 2008 dollars (4%) |          |      |
|                                       |       |           |                   |            |                                                         |      | <b>Project Cost</b>                  |          |      |
|                                       |       |           |                   |            |                                                         |      | <b>\$ 617,800</b>                    |          |      |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                                                    |                                               |
|------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>Project Name:</b> <u>Mashel Eatonville Reach In-stream Restoration Phase II</u> | <b>Project Number:</b> <b>CIP20-MAL-RST01</b> |
| <b>Project Type:</b> <u>Restoration</u>                                            | <b>Sub-Basin:</b> <u>Lower Mashel River</u>   |

**Existing Conditions:** The Mashel River is the largest tributary to the Nisqually River downstream of La Grande Dam. Salmon productivity has been declining for years because of changes in the river basin. There has been a decline in the habitat diversity, pool habitat, and habitat suitable for spawning. This loss of habitat has been caused by unnatural channel narrowing from bank hardening and dikes. The channel narrowing has caused decreased channel stabilization and increased sediment loading from soil erosion. Summer water temperatures have also increased.

**Analysis:** A 2003 restoration analysis has identified the reach between Box Car Canyon and the confluence of the Little Mashel as the highest restoration priority in the Mashel basin. A second analysis of several sub-reaches identified restoration alternatives to increase the spawning and rearing habitat for salmon and trout.

**Proposed Solution/ Project Description:** Phase I restored in-stream diversity and riparian function in approximately half of the degraded areas in this reach. Phase II would address the remaining in-stream habitat issues in this reach. Phase 2 would also include additional landowner outreach prior to complete project designs and permitting. Implementation of this project would increase the channel complexity and protect channel banks near Smallwood Park in Eatonville (Reach 4) and near the confluence with the Little Mashel River (Reach 7). Most of this will be accomplished by using the principles of engineered log jam technology. An estimated 11 larger and 3 smaller log jams will accomplish these goals.

**Design Assumptions:** Engineering estimated as 15% of the project cost. There are four (two in Reach 4 and two in Reach 7) distinct work areas with separate access routes and diversions. No haul off-site.

| Land Costs <sup>1</sup> |      |           |                   |      | Construction Costs <sup>1</sup>  |      |           |          |            |
|-------------------------|------|-----------|-------------------|------|----------------------------------|------|-----------|----------|------------|
| Item                    | Unit | Unit Cost | Quantity          | Cost | Item                             | Unit | Unit Cost | Quantity | Cost       |
|                         |      |           |                   | \$ - | Mobilization and demobilization  | LS   | \$ 10,000 | 1        | \$ 10,000  |
|                         |      |           |                   | \$ - | Water diversion                  | LS   | \$ 3,500  | 4        | \$ 14,000  |
|                         |      |           |                   | \$ - | Clearing and grubbing            | acre | \$ 3,000  | 3        | \$ 8,250   |
|                         |      |           |                   | \$ - | Erosion control                  | LS   | \$ 2,000  | 4        | \$ 8,000   |
|                         |      |           |                   | \$ - | Excavation plus backfill         | cy   | \$ 9      | 11,250   | \$ 101,250 |
|                         |      |           |                   | \$ - | Large woody debris plus delivery | each | \$ 800    | 350      | \$ 280,000 |
|                         |      |           |                   | \$ - | Small woody debris plus delivery | LS   | \$ 7,500  | 1        | \$ 7,500   |
|                         |      |           |                   | \$ - | Log jam construction             | each | \$ 5,000  | 13       | \$ 62,500  |
|                         |      |           |                   | \$ - | Project maintenance              | LS   | \$ 10,000 | 1        | \$ 10,000  |
|                         |      |           |                   | \$ - | Permitting                       | LS   | \$ 5,000  | 1        | \$ 5,000   |
|                         |      |           |                   | \$ - |                                  |      |           |          |            |
|                         |      |           | Total             | \$ - |                                  |      |           |          |            |
|                         |      |           | Contingency (20%) | \$ - |                                  |      |           |          |            |
|                         |      |           | Total Land Costs  | \$ - |                                  |      |           |          |            |

| Project Prioritization Summary |          |
|--------------------------------|----------|
| Flood Hazard Reduction         |          |
| Water Quality Improvement      |          |
| Natural Resource Protection    |          |
| Other Factors                  |          |
| <b>Total Score</b>             | <b>0</b> |

|                                                         |                                        |                   |                |
|---------------------------------------------------------|----------------------------------------|-------------------|----------------|
| <b>Cost/Benefit Ratio:</b><br>(Cost/Priority Score)     |                                        | Total             | \$ 506,500     |
|                                                         | * 45% habitat projects                 | Contingency (**%) | \$ 227,925     |
|                                                         | 35% all other projects                 | Taxes (8.9%)      | \$ 65,364      |
|                                                         |                                        | Sub-Total         | \$ 799,789     |
| ** 35% for construction costs up to \$100,000           | Engineering and Administration (**%)   | \$                | 159,958        |
| 25% for construction cost between \$100,000 - \$250,000 | Total Land Costs                       | \$                | -              |
| 20% for construction cost above \$250,000               | Cost Escalation to 2008 dollars (4%)   | \$                | 38,390         |
|                                                         | <b>Total Project Cost</b>              | <b>\$</b>         | <b>998,136</b> |
|                                                         | <b>Project Cost (15% County share)</b> | <b>\$</b>         | <b>149,700</b> |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       |                                                |             |                  |                 |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-------------------|---------------------------------------|------------------------------------------------|-------------|------------------|-----------------|-------------|
| <b>Project Name:</b> Mashel Eatonville Reach Riparian Revegetation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                  |                   | <b>Project Number:</b> CIP20-MAP-VC01 |                                                |             |                  |                 |             |
| <b>Project Type:</b> Restoration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |                  |                   | <b>Sub-Basin:</b> Lower Mashel River  |                                                |             |                  |                 |             |
| <p><b>Existing Conditions:</b> Many organizations have been working on restoring the riparian buffer along the Mashel River near Eatonville. A lot of progress has been made, but more willing landowners are interested in helping this important fish and wildlife corridor.</p> <p><b>Analysis:</b> A 2003 restoration analysis has identified the reach between Box Car Canyon and the confluence of the Little Mashel as the highest restoration priority in the Mashel basin. The plan also identified several areas in need of riparian restoration or enhancement.</p> <p><b>Proposed Solution/ Project Description:</b> Streamside vegetation plantings in selected areas and along the river as identified in the 2003 assessment. This project will cover only the same reaches as the Mashel Eatonville Phase 2 project (i.e., Reaches 4 and 7). Therefore, planting will not occur until 2009 at the earliest.</p> <p><b>Design Assumptions:</b> We are assuming the reforestation of a 200-foot buffer, 2,100 feet in length (~10 acres) in Reach 4 and a total of 3 acres scattered throughout Reach 7. The density will be 700 potted plants per acre. Tubes will be solid in Reach 4 and mesh in Reach 7. We assume installation will be completed by a Washington Conservation Corps crew. Some chemical site preparation is required in Reach 4. Contingency is 35% based on engineering estimates.</p> |             |                  |                   |                                       |                                                |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | <b>Construction Costs<sup>1</sup></b> |                                                |             |                  |                 |             |
| <b>Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b>   | <b>Cost</b>                           | <b>Item</b>                                    | <b>Unit</b> | <b>Unit Cost</b> | <b>Quantity</b> | <b>Cost</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | \$ -                                  | Mobilization                                   | LS          | \$ 7,500         | 1               | \$ 7,500    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | \$ -                                  | Riparian plants (potted)                       | each        | \$ 4             | 9,100           | \$ 34,125   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | \$ -                                  | Plant protection tubes and stakes              | each        | \$ 3             | 9,100           | \$ 25,025   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | \$ -                                  | Installation                                   | each        | \$ 2             | 9,100           | \$ 15,925   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | \$ -                                  | Site prep                                      | acre        | \$ 1,500         | 10              | \$ 15,000   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | \$ -                                  | Incidentals                                    | acre        | \$ 250           | 13              | \$ 3,250    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   | \$ -                                  | Project maintenance                            | 3 year      | \$ 1,200         | 13              | \$ 15,600   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  | Total             | \$ -                                  |                                                |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  | Contingency (20%) | \$ -                                  |                                                |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  | Total Land Costs  | \$ -                                  |                                                |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       |                                                |             |                  |                 |             |
| <b>Project Prioritization Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                       |                                                |             |                  |                 |             |
| Flood Hazard Reduction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                  |                   |                                       |                                                |             |                  |                 |             |
| Water Quality Improvement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |                  |                   |                                       |                                                |             |                  |                 |             |
| Natural Resource Protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                  |                   |                                       |                                                |             |                  |                 |             |
| Other Factors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |             |                  |                   |                                       |                                                |             |                  |                 |             |
| <b>Total Score</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             | <b>0</b>         |                   |                                       |                                                |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       |                                                |             |                  |                 |             |
| <b>Cost/Benefit Ratio:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |                  |                   |                                       |                                                |             |                  |                 |             |
| (Cost/Priority Score)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                  |                   |                                       |                                                |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       | Total \$ 116,425                               |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       | Contingency (**%) \$ 40,749                    |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       | Taxes (8.9%) \$ 13,988                         |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       | Sub-Total \$ 171,162                           |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       | Engineering and Administration (**%) \$ 42,791 |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       | Total Land Costs \$ -                          |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       | Cost Escalation to 2009 (6%) \$ 12,837         |             |                  |                 |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                  |                   |                                       | <b>Project Cost \$ 226,800</b>                 |             |                  |                 |             |

1. The estimated costs are based on year 2007 dollars and are escalated to year 2008 dollars.