Lower Klickitat Riparian and In-channel Habitat Restoration Project

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Lower Klickitat Riparian
And
In-channel Habitat Restoration Project

Annual Report for September 1, 2001 – August 31, 2002

BPA Project # 1997-056-00

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Summary

This project focuses on the lower Klickitat River and its tributaries that provide or affect salmonid habitat. The overall goal is to restore watershed health to aid recovery of salmonid stocks in the Klickitat subbasin. An emphasis is placed on restoration and protection of watersheds supporting anadromous fish production, particularly steelhead (*Oncorhyncus mykiss*) which are listed as "Threatened" within the Mid-Columbia ESU. Restoration activities are aimed at restoring stream processes by removing or mitigating watershed perturbances and improving habitat conditions and water quality. In addition to steelhead, habitat improvements benefit Chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon, resident rainbow trout, and enhance habitat for many terrestrial and amphibian wildlife species. Protection activities compliment restoration efforts within the subbasin by securing refugia and preventing degradation. Since 90% of the project area is in private ownership, maximum effectiveness will be accomplished via cooperation with state, federal, tribal, and private entities. The project addresses goals and objectives presented in the Klickitat Subbasin Summary and the 1994 NWPPC Fish and Wildlife Program.

Feedback from the 2000 Provincial Review process indicated a need for better information management to aid development of geographic priorities. Thus, an emphasis has been placed on database development and a review of existing information prior to pursuing more extensive implementation. Planning and design was initiated on several restoration projects. These priorities will be refined in future reports as the additional data is collected and analyzed. Tasks listed are for the April 1, 2001 to August 31, 2002 contract cycle, for which work was delayed during the summer of 2001 because the contract was not finalized until mid-August 2001. Accomplishments are provided for the September 1, 2001 to August 31, 2002 reporting period.

During this reporting period, significant progress was made on acquisition and development of spatial data, monitoring of steelhead spawning, riparian revegetation, streamflow monitoring, completion of maintenance and repair work, completion of a working version of a habitat database, and completion of the Swale Creek assessment.

GOAL A. Acquire and manage information to facilitate identification and prioritization of sites for restoration activities

Objective A1. Develop an application to effectively and efficiently manage habitat data. Previously, habitat data was housed in individual spreadsheet files. A relational database was developed in conjunction with YKFP Data Management personnel to increase efficiency and facilitate basinwide geographic prioritization. Eventually, queries and reports will be developed that support EDT, GIS presentation and analysis, and identify stream segments deficient in habitat characteristics for restoration purposes as well as segments that have exemplary conditions for potential use as analogues.

Task A1.1. Develop a relational database to house existing and future habitat data. An MS Access database was developed to house and manage data collected under TFW Ambient Monitoring Protocols for the Reference Point, Habitat, and Large Woody Debris, modules. Items of note for this task include:

- Tables, forms, and queries for the Reference Point (RP), Habitat Unit (HU), and Large Woody Debris (LWD) modules have been completed. The data entry interface was designed to appear as field forms to assist QA/QC.
- All existing LWD, RP, and HU data (60 TFW segments) was been imported into the most current version of the database (v3.0).
- A menu system has been developed to make data management and access for each of the modules more user-friendly.
- Initiated QA/QC measures on programming associated with RP and HU modules.
- Reports and input queries for the LWD module were completed.

Objective A2. Gather existing and, where necessary, generate new spatial data. Spatial data and Geographic Information Systems provide a powerful means of information storage, presentation, and analysis.

Task A2.1. Acquire full digital coverage of the project area by the acquisition of digital orthophotos (DOQs), digital elevation models (DEMs), and digital raster graphics (DRGs). These files serve as excellent base layers for identifying potential projects as well as generating maps for communication and analytical purposes. A t the beginning of the reporting period we had roughly 10% DOQ coverage and 80% DRG coverage. We also had 100% 30m DEM coverage, but needed to acquire 10m DEMs to provide more detailed watershed analysis. Previously, spatial data was acquired at no cost to the project, and we will continue to pursue the most cost-effective means to complete coverages. Items of note for this task include:

- 23 DRG files were acquired at no cost giving us full DRG coverage for the Klickitat subbasin.
- The 10 m DEM has been acquired for the entire subbasin.
- All but two of 42 DOQQs were acquired. We will not actively pursue acquisition of the remaining two quads as they have very small coverage within the Klickitat River watershed.
- Task complete.

Task A2.2. Develop spatial data for historic and present restoration projects and monitoring sites. Using GPS, project sites can be accurately delineated and incorporated into a spatial database so that projects may be quickly referenced from within a GIS. This will be an ongoing task as future project and monitoring sites are identified. Items of note for this task include:

- Two fencing projects and one water system were GPS'd.
- A draft TFW shapefile was completed.
- Sampling locations in Swale Canyon were GPS'd and a shapefile was completed.
- A comprehensive shapefile of historic, current, and anticipated habitat projects in the Klickitat subbasin was completed and provided to the Klickitat Lead Entity for

incorporation into the Salmon Recovery Board's strategic planning process. Project staff contacted Conservation Districts, BIA, other YN Programs, private-non-profit organizations, and state and federal agencies.

- Information was GPS'd potential project sites for reconnecting mainstem floodplain habitat along the Champion Road.
- A shapefile for thermograph monitoring locations was created.

Objective A3. Initiate linkage of spatial and habitat data.

Task A3.1. Reference Arc/View spatial themes with corresponding database information. The emphasis for this contract cycle will be to initiate linkage of the habitat database (Task A1.1) and spatial data (Task A1.2). This will provide for spatial as well as attribute-based analyses and facilitate partial validation of the EDT data. The long-term goal is to upgrade the GIS to ArcGIS v8.2 and use the Access database as a front-end for a SQL Server database to establish a dynamic link that permits data editing from within the GIS, more efficient and powerful analyses, and presentation on the internet. Items of note for this task include:

- A link was completed between ArcView 3.2 and v3.0 of the database in February.
- A demonstration of the link and its capabilities was presented at the YKFP PAR in March. Task Complete.

Objective A4. Identify data gaps and initiate measures to fill them. Two needs to be filled by this project include streamflow information and an assessment of the railroad grade in Swale Creek Canyon. Additional needs will be identified and addressed in future work statements.

Task A4.1. Collect streamflow data on the Little Klickitat River, Swale Creek, Summit Creek, White Creek, and Trout Creek. This will be an ongoing task. Items of note for this task include:

- Two staff gages were installed and one continuous-recording streamflow/temperature/turbidity station was installed.
- Staff gages and continuous recording stations were to be installed near the mouths of the Little Klickitat River and Swale Creek. The Swale Creek site was vandalized; the staff gage was replaced, the continuous recorder was relocated to the Klickitat River.
- Hardware for the continuous gages was supplied by the YKFP Monitoring and Evaluation Project (roughly an $11,000 match).
- We received roughly a 30% match from the YN Water Program for labor related to data collection and QA/QC on the three non-continuous sites.
- Regular flow measurements were taken at Little Klickitat, White Creek, Bear Creek, Summit Creek, and Trout Creek sites.
- Sheet metal boxes were fabricated to protect equipment from vandalism problems.

- We would like to establish additional continuous recording sites in the future. Such establishments will be budget-dependent and manpower availability.

Task A4.2. Identify and prioritize subreaches for restoration in Swale Creek Canyon. Railroad grade construction and maintenance in Swale Canyon severely channelized the stream in many locations causing, among other things, bank and bed scour that has eliminated spawning gravels and vegetation from extensive portions of this thirteen mile reach. A channel stability assessment was conducted to provide the foundation for future restoration work in Swale Canyon by identifying and prioritizing potential work sites. Items of note for this task include:

- Received affirmative responses from 26 of 37 landowners owning stream frontage in Swale Canyon to conduct survey work, accounting for 12 of 13 stream miles in the project area. The other 11 landowners were unresponsive.
- The YNFP obtained an additional $15,000 from the Washington State Salmon Recovery Board and $19,500 from the Mid-Columbia Regional Fisheries Enhancement Group to conduct the assessment.
- Thirty-two typical cross-sections were identified and surveyed by project staff and Interfluve, Inc on properties where permission had been acquired.
- Interfluve, Inc defined the hydrology, completed the hydraulic modeling, and developed the report. Two (2), 10, 25, 50, and 100 year recurrence interval runoff events were modeled given existing conditions (i.e. no action), partial removal, and complete removal for each section.
- 19 of 32 cross-sections showed some confinement effect
- Eight work sites encompassing 15 cross-sections were identified for restoration activities.
- A draft report was reviewed by YNFP, Washington State Parks staff, and representatives from MCRFEG and SRFB.
- The final report, completed in June 2002, provides conceptual design prescriptions, cost estimates, and a cost-benefit matrix to assist prioritization.

Task A4.3. Assess the amount of riparian and wetland habitat lost in the headwaters of Swale Creek during the period of record. Visual inspection of valley morphology suggested that the Centerville Valley had a much greater proportion of wetland and riparian habitat historically. This inference was supported by inspection of geologic maps that confirmed field the Centerville valley as a synclinal basin with an anticlinal downvalley control. Inspection of soil conditions in several pastures near Warwick revealed heavy (fine-textured) soils with mottling typical of wetland environments. It is hypothesized that loss of wetland function in the headwaters of Swale Creek has contributed to degradation in the fish-bearing portion of Swale Creek downstream. Items of note for this task include:

- Sources of historic aerial photography were identified and contacted, however, historic aerial coverage was more limited than previously thought with no complete coverage occurring until 1975. Where partial coverage was available, there was not

much contrast between riparian conditions in 1954 and today, suggesting that land-use impacts pre-dated earliest available photography.

- Given the lack of historic aerial photography, project staff researched survey notes from Government Land Office (GLO) cadastral surveys of the area in the 1870s. Even though some settlement had already occurred in the area prior to initiation of the GLO surveys, this information still provides the best environmental baseline.
- The core area of suspected historic wetlands occurs in T3N, R15E. Visual inspection of the plats indicates that there was historically considerably more wetland habitat in this township.
- Boundaries of "the Swale" were digitized from the Government Land Office survey notes for T3NR15E. Points were digitized along section lines then converted into a polygon to allow estimation of area. Because the survey was conducted in September, it provides the best idea of what late-season wetland conditions were that we have found. This information suggests that roughly 1570 acres of wetland existed in T3N, R15E in 1870.
- The geometry of the historic "swale" boundaries doesn't correspond well to current stream meander patterns and topography in portions of Sections 15, 16, 17, 20, and 21. This inconsistency has not been resolved.
- Current "swale" boundaries were delineated based available black and white imagery from 1998. These delineations indicate roughly 106 acres within wet areas considered part of the "Swale" in T3N, R15E. Because of the difficulty assessing boundaries based on B&W imagery, this result should be considered preliminary until confirmed by color infrared imagery in terms of absolute quantities. However, in terms of relative condition, it seems quite clear that there has been a major reduction in the amount of wetland habitat along Swale Creek in this township.

Task A4.4. Identify sites to restore floodplain connectivity on the mainstem Klickitat River between river miles 15 and 32. Though no longer in use, the old Champion haul road continues to dissect floodplain habitat by acting as a levee for portions of its length. Items of note for this task include:

- Oldest available aerial photography is more expensive than anticipated and does not predate construction of the grade. There is partial coverage (~50% of river length) from 1954, but no complete coverage until 1975.
- Identified and GPS'd five potential project sites where the road interferes with floodplain connectivity with the mainstem Klickitat River and one that disrupts bedload and debris transport of a tributary (Beeks Canyon) along the segment downstream of the first complete washout (~lower 7 miles of road). Prism dimensions were measured and volume estimates were calculated.
- A comprehensive map of the entire reach will be developed in the future with all potential sites for restoration.

Task A4.5. Assist Klickitat Watershed Assessment. A watershed assessment contracted through BPA for the Klickitat subbasin was anticipated to begin in the summer of 2001.

This effort was to provide an umbrella for basinwide restoration projects and local assessments. Items of note for this task include:

- Project staff met with assessment coordinator on at least three occasions and numerous phone conversations. Staff provided available habitat and temperature data, information, and anticipated needs including GIS files and available metadata. Communicated needs and data gaps by relative priority.
- BPA cancelled the contract for the watershed assessment, effectively terminating this task.

Goal B. Protect, restore, and enhance priority watersheds and reaches to increase riparian, wetland, and stream habitat quality. Restore stream habitat conditions by in-situ and watershed-scale activities that mitigate or resolve conflicting historic, present, and/or future land-uses.

Objective B1. Protect areas of existing high-quality habitat condition and prevent further deterioration of degraded habitats.

Task B1.1. Pursue conservation easements and acquisitions to protect important fish habitat. Many landowners are unwilling to conduct or permit conservation activities on their properties without compensation for foregone economic opportunities. Since this project does not presently have a funding mechanism to accomplish this task, outside funding sources and the assistance of land trusts will be pursued. We are currently at the stage of developing and fostering landowner interest in easements and/or acquisition on a willing buyer – willing seller basis. We have worked successfully with Columbia Land Trust in the past and will continue to partner with them on related projects. The Little Klickitat River, Swale Creek, Logging Camp Creek, and Dillacort Creek watersheds as well as the mainstem Klickitat River are priority areas for this task due to land-use intensity and fragmentation threats, and importance to steelhead production in the lower Klickitat Basin. Items of note for this task include:

<u>Progress Report</u>:

- Columbia Land Trust closed on parcels related to the Dillacort Creek project in September 2001. The parcels total 580 acres and include the entire anadromous-accessible portion of the stream as well as over ¾ mile of mainstem Klickitat River frontage. Additionally, the property is adjacent to roughly 1000 acres of state lands administered by WDNR and WDFW. Project staff had previously helped CLT prepare grant application that was funded by the SRFB and are tracking YKFP monitoring efforts related to Dillacort Creek for in-kind purposes.
- Provided Columbia Land Trust with technical information and assisted technical writing of a grant to acquire ½ mile of Logging Camp Creek and adjacent uplands. The parcel totals 298 acres and is adjacent to 40 acres of state land. Acquisition would secure ownership of the entire steelhead-bearing reach and much of the adjacent uplands.
- Grant was approved for funding by SRFB and CLT finalized their contract with IAC in May 2002.

- Developed a subcontract with Columbia Land Trust that provides matching funds to cover appraisal costs for acquisition of Logging Camp Creek parcel.

Task B1.2. Comment on documents proposing new or altered land-use (e.g. SEPA, MDNS) actions that potentially affect fish habitat or watershed conditions. Klickitat County is the only county in the State of Washington that has not adopted a Critical Areas Ordinance that complies with the Growth Management Act (1993), so proposed land-use actions need to be monitored to minimize the likelihood that today's land-use actions will become tomorrow's problem. Items of note for this task include:

Progress Report:

- Discussions with Department of Ecology personnel expressing concerns about effluent discharge (particularly elevated water temperatures) from gas-fired power plant being constructed in Goldendale. Plant will supposedly discharge into City of Goldendale wastewater stream under existing permit. One proposal with potential to have significant watershed effects was identified, but review of the document indicated that appropriate mitigative actions were being taken. No comments were submitted.
- Provide a technical review and extensive comments on the draft Little Klickitat River Watershed Temperature Total Maximum Daily Load report and submitted to WDOE.
- Attended a public meeting on the Klickitat County Energy Overlay EIS.

Objective B2. Enhance areas of degraded stream channel and/or habitat condition. This objective involves development and implementation of protection and restoration projects. It also involves providing technical input and development assistance on protection and restoration projects sponsored by other entities.

Task B2.1. Stabilize an active headcut and enhance 3000' of the Little Klickitat River between river miles 11.3 and 11.9. This upper half of this reach is characterized by raw banks and bed scour including an 800' subreach that has downcut roughly six vertical feet. Some channel instability is likely a result of bedload from upstream reaches that was deposited during the 1996 floods. The upper half of the reach is also lacking sufficient riparian canopy. The lower half of the reach is in comparatively good condition and can serve as a partial analogue for restoring the upper half. Livestock will be excluded from the immediate channel area and an off-channel watering system will be developed. This project will primarily consist of revegetation and bioengineering treatments with in-channel LWD placement in the highly incised subreach. Items of note for this task include:

- During the previous reporting period, a fence was constructed to create a distinct riparian pasture for the lessee. Survey data was collected and a conceptual design was developed. We had intended to provide an off-channel watering source for the new upland pasture (isolated from the riparian pasture by fence construction), however, delayed approval of the FY 2001 work statement and budget prevented implementation during the 2001 field season. The project was rescheduled for

implementation in 2002, but the landowner appears to have lost interest because of the delay. We will continue to include this task in future work statements as a placeholder in the event landowner interest is revived.

Task B2.2. Stabilize 2200' of streambank on the Little Klickitat River between river miles 12.7 and 13.2. The Klickitat Lead Entity received a Washington State Salmon Recovery Grant to restore this section of the Little Klickitat River. The grant covers materials and labor for in-channel work. The LKRICHRP will fund Americorps personnel to deploy geotextile material and conduct revegetation activities. Items of note for this task include:

- The design was originally conducted by local NRCS personnel. The state NRCS office required more survey data and design revisions which delayed implementation. State-level NRCS officials requested and performed additional survey work to facilitate a revised design.
- NRCS and the Conservation District officials assure us that the design has been completed and is currently under permit review.
- The project is scheduled for implementation in the fall of 2002. Services provided by LKRICHRP will be provided in the fall of 2002 and spring of 2003.

Task B2.3. Cost-share purchase of a direct-seed (a.k.a. no-till) drill to reduce runoff and fine sediment delivery to stream channels (particularly, the Little Klickitat River and Swale Creek). Because most agricultural operators presently do not incorporate cover crops into their rotations or leave stubble residue on fallow fields, there is a large amount of fine sediment introduced into the Little Klickitat River and Swale Creek. No-till practices have demonstrated benefits for decreasing runoff and erosion. As the practice has gained in popularity the availability of required equipment for custom farming is now in high demand. Consequently, it is unavailable to many operators who would like to adopt the practice. Most farmers within the geographic scope of this project farm small plots (<400 ac) and therefore it is not economical for them to purchase the equipment individually (drills can range from $20-50,000). Therefore, to promote the use of this practice we will seek an outside match of at least 30% to disperse purchase cost. The Central Klickitat County Conservation District (CKCCD) will administer use-of the equipment and assume subsequent maintenance costs. Items of note for this task include:

- Met with CKCCD staff and agreed that purchase of a smaller (`16') drill would be appropriate to provide maximum compatibility with landowners who would use it and minimize competition with custom farmers. CKCCD staff said they would propose the idea to the district Board and develop equipment specifications. The Conservation District was reluctant to commit to administration and maintenance of the drill.
- Funding for this task was dropped from the final c budget approved by BPA. Consequently, drill purchase did not occur. Engaged in several conversations with operators to stimulate continued interest in no-till practices.

Task B2.4. Remove a passage barrier on Logging Camp Creek. The Klickitat Lead Entity has received a Washington State Salmon Recovery Grant to remove an old railroad bridge on Logging Camp Creek (confluence at ~RM 9.5 with mainstem Klickitat). Because of low head space, bedload and debris has built-up behind the structure and impedes fish passage. Items of note for this task include:

- The LKRICHRP project biologist initiated discussions with County representatives and Washington State Parks staff regarding removal of structure. Despite uncertainty regarding whether or not right-of-way will be converted to a trail, State Parks didn't want to remove a structure without putting in a new one. Though the project was not even on WSP to-do list initially, continued discussion from LKRICHRP and WDFW staff increased the status of this project on their priority list.
- Washington State Parks removed the structure in November 2001 at no cost to either the SRFB grant or LKRICHRP.
- Preliminary WSP design for a replacement crossing was inadequate to pass bedload and debris. LKRICHRP project biologist collected cross-sectional, profile, and substrate data. Reduced and performed cross-sectional analyses to assist design specifications and synthesized into recommendations for Washington State Parks to consider for the replacement crossing.
- The replacement crossing is scheduled for installation by WSP in October 2002.

Task B2.5. Revegetate 400' of streambank on the Little Klickitat River in the vicinity of river mile 20.5. Items of note for this task include:

- An initial assessment of the site was conducted in August 2000, however, subsequent planning and design were put on-hold due to the extended absence of the landowner.
- Delayed approval of the work statement and budget prevented implementation during the 2001 field season. Consequently the planting window was missed and the landowner lost interest. This task was included in the work statements as a placeholder in the event landowner interest was revived.

Task B2.6. Restore 300' of meadow habitat in the headwaters of White Creek. This project will restore lost wetland habitat and meadow to diminish high flows and restore low flows to this and downstream reaches. Work for this reporting period was to have consisted of planning and design activities. Items of note for this task include:

- Delayed approval of the work statement and budget prevented progress during 2001.
- Livestock use in the meadow was monitored and had discussions and a site visit with BIA Range Conservationist about grazing issues in the area and potential fencing. Herbaceous use was generally well within acceptable limits. Some streambanks trampling was evident. Decided that fencing is not a cost-effective option and that potential off-site water developments and salting locations could take pressure off the meadow.

- Appropriate plant species were selected for restoration and appropriate seed sources were identified. Seed for two species of sedge native to the site was obtained and provided to a local nursery which performed appropriate horticultural treatments and grew into plugs.
- Planted 1960 sedge plugs at selected sites along 1500 feet of streambank in May 2002.
- Revisited the site in July and estimated survival at over 90% with plugs already spreading their basal coverage.

Task B2.7. Identify and mitigate unscreened surface water diversions. Two pump intakes were identified that were thought to be unscreened. Discussion with the respective landowners and closer inspection revealed that they were in fact screened, but may have approach velocities that were too high. Items of note for this task include:

- Work will have to wait until in-channel work associated with Tasks 2.1 and 2.2 is completed, likely in summer 2002. Delays in task 2.2 and uncertainties associated with task 2.1 prevented this task from being implemented during the reporting period.

Task B2.8. Repair pressurized off-channel livestock watering system on Swale Creek. The system sprung 5 leaks during the summer and fall of 2000 and winter of 2001. Plumbing associated with the pressurized tank was damaged by an early frost before the system was drained. Delay in budget and work statement approval prevented implementation during the previous reporting period causing landowner to graze and water in creek (the only other reasonable watering alternative). This work will repair and better insulate the wellhead and replace problem sections of the delivery line. Items of note for this task include:

- All 9400' of line was pressure tested. The section of line where ruptures had occurred (along a 1600' section) had been originally installed too shallow and was replaced. Two pressure-reducing valves were spliced into the line segment with the greatest amount of drop. Eight frost-free hydrant valves were excavated and the drain pockets were re-graveled and capped with filter fabric. A space heater was hard-wired into the well-house. The well house was blocked, insulated, and replumbed. Task complete.

Task B2.9. Restore the lower 1.0 mile of Dillacort Creek. Columbia Land Trust, with the assistance of the LKRICHRP project biologist, has received a Washington State Salmon Recovery Grant to acquire the portion of Dillacort Creek that supports steelhead production. Extensive flooding has greatly reduced habitat complexity, scoured spawning gravels, and eliminated riparian vegetation. Columbia Land trust closed on the property in September 2001. During this reporting period, work associated with this task was directed at identification of potential restoration sites and assessment of their feasibility. Items of note for this task include:

- Several site visits with CLT staff were conducted to discuss restoration options, including: fencing, large woody debris placement, and riparian revegetation.
- Based on collective observations over several years it is apparent that livestock influence along the creek is minimal and fencing would not be a cost-effective prescription.
- Large woody debris placement would have high benefits to fish, but would be very challenging logistically. The canyon is rugged and access is poor requiring specialized equipment such as a spider-hoe as well as aerial cabling operations. Given summer baseflow issues with the stream along much of its length, LKRICHRP staff are reluctant to commit this scale of effort until other geographic priorities have been addressed.
- Revegetation and removal of floodplain fill materials in the lower ¼ mile of stream appeared to be the most feasible alternative. CLT staff contacted their grazing permittee and confirmed that potential alterations would not adversely affect his operations. Revegetation would be beneficial and cost effective, but mechanical alterations like would not be worthwhile at this time.
- A spawning survey conducted in April documented 5 adult steelhead and 3 redds within the portion of the creek acquired by Columbia Land Trust with LKRICHRP assistance.
- CLT will be developing a management plan for the property during the next reporting period. LKRICHRP staff will continue to provide technical information.

Task B2.10. Restore fish passage on Snyder Creek at the Klickitat Mill dam. This task was originally scheduled for FY00 but was delayed because the landowner declared bankruptcy and the property defaulted to Klickitat County. Work was expected to proceed in November 2001, however, a toxicity assessment of the site has not been completed. This assessment must be complete before work can proceed according to OSHA and Department of Ecology safety requirements. This work is being conducted in association with c, two SRFB grants (awarded to Klickitat County), matching funds provided by the Mid-Columbia Regional Fisheries Enhancement Group, and in-kind services provided by WDFW. The project will restore passage in the 2600' long concrete flume, past the dam site, and two road crossings within 3500 feet above the dam. Items of note for this task include:

- One of the Potentially Liable Parties (PLP) entered into a voluntary clean-up agreement with Department of Ecology and Klickitat County. The PLP has hired a consultant to develop an assessment plan and conduct a hazardous material investigation. The PLP hired a consultant to analyze soil and ground water samples from sites with the greatest probability of contamination.
- Preliminary indications from Klickitat County and WDOE are that there are no hazardous compounds in the immediate vicinity of the flume or dam to be concerned about from a human health perspective. Pending cleanup and WDOE clearance, design and permitting will resume in Fall 2002.
- The toxics assessment is still ongoing and the report is currently expected in fall 2002. The timelines for the toxicity assessment and cleanup prevented

implementation during the current reporting period. This task will be carried over into the next reporting period with implementation expected to start in July 2003.

- Conducted several site visits to observe fish/presence absence in flume and one survey of the stream above the mill site to look for adult steelhead. A female steelhead was observed roughly 300 yards upstream of the upper culvert site scheduled for replacement. This is the only anadromous fish observed upstream of the dam since it was constructed over 80 years ago. She was in poor condition and was not likely to spawn.

Goal C. Monitor project site-specific and basin-wide conditions to assess habitat trends and effectiveness of restoration activities.

Objective C1 Monitor site-specific habitat conditions. Data on in-stream habitat, channel morphology, channel substrate, riparian vegetation, and salmonid populations will be collected with each class of data given a priority based on the restoration actions taken. Items of note for this task include:

- Habitat Unit, Large Woody Debris, and Reference Point data were collected on a TFW segment on White Creek.
- Launched one thermograph each in Logging Camp and Wheeler Canyon Creeks.
- Conducted spawning surveys in conjunction with YKFP Klickitat M&E personnel in Snyder, Logging Camp, Dillacort, Trout, White, Brush, and Canyon Creeks.

Objective C2. Monitor basinwide habitat conditions. To facilitate evaluation the project's activities and identify further needs at a watershed-scale, monitoring of streamflow, temperature (combined efforts of YKFP M&E and LKRICHRP project staff), outmigration (by YKFP M&E project), and substrate (combined efforts of YKFP M&E and LKRICHRP project staff) will be conducted at several fixed locations throughout the basin. Items of note for this task include:

- The Swale Creek staff gage was reinstalled after it was vandalized.
- Regular flow measurements were taken at Little Klickitat, White Creek, Bear Creek, Summit Creek, and Trout Creek sites. The continuous recording gage on the Little Klickitat was maintained.
- Turbidity data has some spikes that occurred in the absence of changes in stage. Explanation of the events will probably require the use of an IFCO or some other timed grab-sampler to try to standardize the meter with water conditions.
- Anchoring of the sensors for the continuous recording station on the Little Klickitat continues to be problematic. The site is located on a good, stable section of the river, but the landowner won't allow installation of the staff gage in the creek. Currently the staff is located on the bank and manual stage readings are taken using a leveling procedure. Without a staff gage within the wetted channel to tie the sensors to, the stage relationship of the pressure transducer will be marginal. Temperature and turbidity measurements should be unaffected.

Other activities of note during the reporting period include:

- Discussed potential for increasing geographic scope of project to include entire basin at the contractual level with BPA and Power Planning Council staff. Outcome of conversation indicated that, despite no change in the overall dollar amount, such an action would require approval by CBFWA and PPC. Were informed that such a request should include a justification and address ISRP comments and relate proposed changes to the proposal from the Provincial Review. Drafted a letter formally requesting an increase in the geographic scope to CBFWA. CBFWA Anadromous Fish subcommittee reviewed the request and forwarded it to the CBFWA Managers who reviewed the request in April and forwarded it on for NPPC approval.

- Submitted a grant proposal to the SRFB requesting funds to assist passage improvements on two road crossings in the Trout Creek watershed. One is on Trout Creek and the other is on Bear Creek. Both have been identified using WDFW protocols as passage barriers.

- The Yakama Nation purchased an office facility at Wahkiacus that will become the duty station for YN Fisheries staff working in the Klickitat subbasin. Moved into new office in March 2002. LKRICHRP project staff got computer network up and running including installation of all network infrastructure, computers, and hardware.

- LKRICHRP staff dedicated considerable time to assisting the local SRFB process including:

    - Attending SRFB Technical Review Panel meeting in Wenatchee. Provided technical insight to TRP on three grants submitted by sponsors through the Klickitat Lead Entity.
    - Attended regular CRC and TAG meetings to assist Strategic Plan development. The CRC has begun to work on bylaws and keep formal minutes of their meetings.
    - Attended SRFB Lead Entity Strategy workshop in Wenatchee. This forum provided the opportunity to interact from representatives from other LEs throughout the state and gain insights to effective and not-so-effective actions for salmon-recovery planning and implementation.

- Collected, prepared, and planted 3,085 willow cuttings along 1200' of the mainstem Klickitat River in the vicinity of Kessler Ranch. Work was paid for by a SRFB grant.

- Provided design and permitting assistance to YKFP Klickitat M&E project for relocating the lower mainstem rotary screw trap.

- Provide technical assistance in planning an assessment of hydrologic conditions on alluvial fan mouth of Swale Creek associated with the proposed Wahkiacus Acclimation Facility.

- Conducted a technical review of grants submitted to the Klickitat Lead Entity for SRF Board funding. Met with members of the SRFB Technical Review Panel. Provided technical support for the CRC during the meeting where projects were discussed and ranked.

- Continued riparian revegetation efforts along the Diamond Fork Creek in Klickitat Meadows. Collected, prepared, and planted 5447 willow livestakes along 3300 feet of stream in October 2001. Sampled two monitoring transects in areas planted with willow livestakes in October 2000 that had 79.4% and 88.2% survival, respectively. Work was paid for by a SRFB grant.