

# Lower Klickitat Riparian and In-channel Habitat Restoration Project

## Klickitat Watershed Enhancement



Annual Report  
2002 - 2003



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# **Klickitat Watershed Enhancement Project**

**Annual Report for September 1, 2002 – August 31, 2003**

**BPA Project # 1997-056-00**

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## **SUMMARY**

The overall goal of the Klickitat Watershed Enhancement Project (KWEP) is to restore watershed health to aid recovery of salmonid stocks in the Klickitat subbasin. An emphasis is placed on restoration and protection of stream reaches and watersheds supporting native anadromous fish production, particularly steelhead (*Oncorhynchus mykiss*; ESA- listed as “Threatened” within the Mid-Columbia ESU) and spring Chinook (*O. tshawytscha*).

Habitat restoration activities in the Klickitat subbasin augment goals and objectives of the Yakima Klickitat Fisheries Project (YKFP), NPPC Fish and Wildlife Program, Klickitat Subbasin Summary and the NMFS Biological Opinion (All-H paper). Work is conducted to enhance instream and contributing upland habitat to facilitate increased natural production potential for native salmonid stocks. Efforts in the Klickitat Subbasin fall into two main categories: 1) identification and prioritization of sites for protection and restoration activities, 2) implementation of protection and restoration measures. KWEP personnel also assist monitoring efforts of the YKFP Monitoring & Evaluation Project.

During the September 2002 –August 2003 reporting period, KWEP personnel continued efforts to address feedback from the August 2000 Provincial Review that indicated a need for better information management and development of geographic priorities by:

- Assisting development of the Strategic Habitat Plan for the Klickitat Lead Entity (Task A3.1) and Klickitat steelhead EDT model (Task A4.1)
- Improving the functionality of reference point, habitat unit, and large woody debris modules of the habitat database as well as addition of a temperature module (Tasks A1.1-1.2)
- Continuing development and acquisition of GIS data (Task A1.3)
- Ongoing data collection efforts to fill information gaps including streamflow, habitat, and temperature (Objectives C1 and C2)
- Completion of planning, field work, and hydrologic modeling associated with roads assessment in the White Creek watershed (Task A4.2)

Significant milestones associated with restoration projects during the reporting period included:

- Completion of the Surveyors Fish Creek Passage Enhancement project (Task B2.3)
- Completion of interagency agreements for the Klickitat Meadows (Task B2.4) and Klickitat Mill (Task B2.10) projects
- Completion of topographic surveys for the Klickitat Meadows (Task B2.4), Klickitat River Meadows (Task B2.5), Trout Creek and Bear Creek culvert replacements (Task B2.7), and Snyder Swale II (Task B2.13) projects
- Completion of the Snyder Swale II – Phase 1 project (Task B2.13)
- Completion of design, planning, and permitting for the Klickitat Mill project (Task B2.10) and initiation of construction
- Design for the Trout and Bear Creek culverts (B2.7) were brought to the 60% level
- Completion of design work for the for the Klickitat Meadows (Task B2.4) and Klickitat River Meadows (Task B2.5) projects

## **INTRODUCTION**

The overall goal of the Klickitat Watershed Enhancement Project (KWEP) is to restore watershed health to aid recovery of salmonid stocks in the Klickitat subbasin. An emphasis is placed on restoration and protection of stream reaches and watersheds supporting native anadromous fish production, particularly steelhead (*Oncorhynchus mykiss*) and spring Chinook (*O. tshawytscha*). Steelhead in the Klickitat subbasin are ESA-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. Protection activities compliment restoration efforts within the subbasin by securing refugia and preventing degradation. In addition to steelhead and spring Chinook, project actions benefit non-target stocks such as fall Chinook and coho (*O. kisutch*) salmon, resident rainbow trout, coastal cutthroat trout (*O. clarki clarki*), bull trout (*Salvelinus confluentus*; ESA-listed as “Threatened” within the Lower Columbia Recovery Unit), and enhance habitat for many terrestrial and amphibian wildlife species. Through these restoration efforts, available habitat has increased for spawning, juvenile rearing, velocity refugia, passage, and adult holding.

KWEP is a Bonneville Power Administration (BPA) funded watershed project implemented by the Yakama Nation Fisheries Program (YNFP) that is the mechanism for addressing Klickitat subbasin habitat issues as part of the YKFP. KWEP is the principal ongoing funding mechanism for salmonid habitat restoration in the subbasin and has been integral to securing in-kind matches from the Washington Salmon Recovery Funding Board (SRFB) and Mid-Columbia Regional Fisheries Enhancement Group (MCRFEG). These other sources have augmented BPA monies and have been used to more effectively distribute funding for habitat enhancement projects in the Klickitat Subbasin. The project addresses 1994 Columbia Basin Fish & Wildlife Program goals of an ecosystem approach to species recovery through protection and improvement to habitat conditions.

KWEP was previously called the Lower Klickitat Riparian and In-channel Habitat Restoration Project (LKRICHRP) and focused on the lower 43 miles of the mainstem Klickitat River and its tributaries. Originally recommended by the Northwest Power Planning Council (NPPC) for funding by BPA in 1997, LKRICHRP was recommended for continued funding by the NPPC as an outcome of the 2000

Provincial Review. In June 2002, the NPPC approved the name change and an increase in the geographic scope of the project to encompass the entire Klickitat subbasin. Objectives, tasks, and budget as approved in the 2000 Provincial Review were otherwise unchanged. This reporting period (September 2002 through August 2003) is the first to encompass the increased geographic scope. At the prompting of BPA, the YNFP requested and received a no-cost time extension for the present contract through October 31, 2003.

Personnel funded by KWEP include one Habitat Restoration Specialist (1.0 FTE), one Bookkeeper III (0.5 FTE), one Bookkeeper IV (0.25 FTE), one Water Technician I-B (0.2 FTE), one Water Technician IV-J (0.1 FTE), one Hydrologist (0.1 FTE), one Archeologist (0.1 FTE), and one Cultural Resource Specialist (0.2 FTE). YKFP Data Management personnel were critical to accomplishments associated with habitat databases development and management. YKFP Monitoring and Evaluation personnel were integral to monitoring-related accomplishments. Other cooperators that played key roles for specific tasks are identified accordingly below.

## **ACCOMPLISHMENTS**

### **Goal A. Continue assessment and prioritization of sites for restoration activities.**

#### **Objective A1. Continue assessment of existing habitat conditions.**

A relational database was created during the FY01 contract period to manage and analyze habitat data. Database modules for Reference Point (RP), Habitat Unit (HU), and Large Woody Debris (LWD) are based on data relationships associated with the TFW Ambient Monitoring Protocols. The relationships in the temperature database were developed to most efficiently accommodate YN data and facilitate quality control and maintenance on sensors and sites. Database management and development continued during the present reporting period.

#### **Task A1.1. Finish QA/QC on existing modules in habitat database.**

This task addressed RP, HU, LWD, and temperature data for the habitat database. Quality control and assurance targeted both error-checking data troubleshooting bugs in the program. This task was accomplished in cooperation with YKFP Data Management Project personnel. Items of note for this task include:

- All known quality control problems in the database application were resolved
- The report for RP module was completed
- Individual piece and jam summaries were added to the LWD report
- The user-interface of the database was modified to be more user-friendly and reduce the potential for inadvertent changes
- Tables and entry forms were developed for Level II LWD data
- Tables, relationships, queries, and reports were completed for the temperature database
- Elements were added to facilitate tracking of measurement devices and maintenance
- Error-checking of historic temperature data was completed
- All historic temperature data (roughly 1,000,000 records) were imported from spreadsheets into the new database
- Charting functions for temperature database were developed to allow specification of date ranges and a broader suite of summary criteria.

**Task A1.2. Complete forms for existing modules in habitat database.**

This task addressed RP, HU, LWD, and temperature data for the habitat database. This task was accomplished in cooperation with YKFP Data Management Project personnel. Items of note for this task include:

- Forms for RP, HU, and LWD modules were completed
- A new input form was created to accommodate Level 2 LWD data.

**Task A1.3. Continue development of relevant spatial data.**

New spatial data was created and existing coverages were updated as necessary. Items of note for this task include:

- Newly identified barriers/obstructions were added to the passage shapefile and distributed to WDFW
- A draft shapefile for current and historic stocking locations was developed
- Area maps were completed for the Klickitat Meadows, Klickitat River Meadows, Trout, and Bear Creek projects
- A point coverage for weather stations and stream gages was completed
- TIN and contour coverages for worksites associated with the Trout Creek (1), Bear Creek(1), and Klickitat Meadows(2) projects were created based on topographic survey data
- Sample spatial data design and maps were provided the Northwest Service Academy (AmeriCorps) to assist organization and presentation of their passage inventory study
- A point layer of known *O. mykiss* locations was created to document maximum distribution and was forwarded to WDFW
- Maps for work sites, harvest areas, and rock collection sites for the Klickitat Meadows and Klickitat River Meadows projects were created.

**Objective A2. Identify and review information on historic habitat conditions.**

**Task A2.1. Review and incorporate relevant information from cadastral survey notes for 5 townships into existing GIS layer.**

Identification, acquisition, and review of historic information to gain insight on baseline conditions is an ongoing KWEP task. Items of note for this task include:

- Obtained digital copies of plat maps for 39 Klickitat basin Townships. Relevant notation from five of the plats was incorporated into existing GIS layers.
- Time demands of other tasks did not allow time to get to library in Seattle to acquire hardcopies of notes
- Visited historic society in Klickitat to assess availability of historic photos and other potentially relevant information.

**Objective A3. Assist development of a Strategic Habitat Plan for the Klickitat subbasin.**

**Task A3.1. Develop a document that identifies restoration priorities and a list of projects.**

This will likely involve working with local Technical Advisory Group (TAG) and Citizens Review Committee (CRC) to develop a Strategic Plan (under the Washington State 2496 process). Results of Objectives A1 and A2 will be used to assist this task. Items of note for this task include:

- A draft version of the strategic plan was completed by the TAG and Lead Entity and was forwarded to the CRC in late-fall 2002. The CRC made revisions and it was forwarded to the SRFB in January 2003. Since then it has gone through several editorial iterations and efforts are currently focused on incorporating more information on geographic priorities in maps and tables.
- KWEP personnel were integral in providing input on fish distribution and played the primary role in identifying geographic priorities within the Klickitat subbasin.
- KWEP personnel participated on a subcommittee that drafted by-laws for the TAG.

**Objective A4. Identify data gaps and initiate measures to fill them.**

Efforts continued to fill data needs including streamflow information on five tributaries (Bear Creek, Little Klickitat River, Swale Creek, Trout Creek, and White Creek) and an assessment of road-stream connectivity in selected watersheds.

**Task A4.1. Assist basinwide assessments.**

The project biologist assisted Klickitat Watershed Assessment and an EDT revision by providing spatial and habitat data as well as local knowledge of the area and its resources. The Klickitat Watershed Assessment project was terminated by BPA in Oct 2002. Because personnel are not available to take the lead on such an effort, KWEP staff associated with this project focused on assisting less-extensive assessment related tasks (A4.2, A4.3, B2.1, and B2.8). Items of note for this task include:

- KWEP staff provided habitat data, field notes, reports, and arranged office and site visits to assist refine EDT analysis. New reach delineations were defined and refined.
- KWEP staff also provided several reviews, extensive comments, and sample maps to the Northwest Service Academy (AmeriCorps) to assist their efforts at inventorying passage barriers in tributaries of the lower Klickitat subbasin.
- WDFW culvert inventory procedures (Level A) were applied at ten road crossings within the Yakama Nation Closed Area by Klickitat M&E personnel. Data QA/QC, entry, and analysis, was conducted by KWEP staff. KWEP staff also conducted a QA/QC review on previous culvert inventory data.

**Task A4.2. Assess hydrologic connectivity of roads in five watersheds.**

Road-stream interaction is of interest in White, Summit, Surveyors, and Trout Creek watersheds. Funding for this task was to be cost-shared between KWEP, the BPA-funded Klickitat Watershed Assessment (KWA) project, a BIA grant, and in-kind staff time funded by YN tribal trust money. Because the KWA was terminated by BPA in November 2002, less funding was available and the geographic scope was decreased (Summit and Surveyors Creek watersheds were put on hold). White Creek was selected as a test watershed for the initial study to develop and refine field methodology. Items of note for this task include:

- KWEP and cooperating staff developed draft field protocols and a database to house the data. Goals, objectives, timelines, and scope were developed. Due to workloads, it was decided to sub-contract the initial study. A Request-For-Proposals (RFP) was advertised, Northwest Hydraulic Consultants (nhc) was selected as the successful firm, and the sub-contract was finalized.
- Sub-watersheds within the White Creek were delineated and characterized based on criteria such as slope, basin elevation, drainage density, and road density. Two sub-



watersheds (upper White and upper Tepee) were selected for field inventory and modeling. Field methodology was finalized and HEC-HMS was selected as the hydrologic model. Field inventory and modeling were completed. Because of the no-cost time extension from BPA, the YN extended the performance period of the nhc sub-contract to allow more time for report development and review. A draft report will be submitted by nhc for review by YNFP in September with a final report scheduled for October 2003.

**Task A4.3. Assist identification of road abandonment and restoration priorities.**

Project staff provided technical assistance to other YN programs identifying and developing scope for rehabilitation or abandonment of road segments. Items of note for this task include:

- KWEP staff conducted a site visit and review of conceptual designs for road-related stream stabilization projects at three locations on the Klickitat River. Proponents had not conducted any planning or permitting. Due to poor planning and inadequate design and habitat considerations by proponents, KWEP staff successfully recommended project postponement. Project proponents have not pursued the matter farther. KWEP personnel may take-on sponsorship of the project in 2005.
- KWEP staff conducted conversations with BIA Forest Engineering on road segments in the Trout Creek watershed that are having obvious adverse hydrologic impacts on streams in the area. These roads are slated for improvement associated with a timber sale to occur next summer.

**Goal B. Protect, restore, and enhance priority watersheds and reaches to increase riparian, wetland, and stream habitat quality.**

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

**Task B1.1. Pursue easements and land acquisitions.**

Some landowners are unwilling to conduct or permit conservation activities on their properties without compensation for foregone economic opportunities. Residual high quality habitats will receive priority as well as degraded habitats identified as important for restoration. Since KWEP does not presently have a funding mechanism for protective actions, outside funding sources and the assistance of land trusts have been 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. Successful partnerships with Columbia Land Trust in the past have continued to be productive. Items of note for this task include:

- Representatives from Columbia Land Trust continued discussions with one Swale Creek landowner with whom KWEP staff had initiated conservation easement discussions in summer 2002.
- Access issues associated with the Logging Camp property temporarily delayed progress on acquisition of approximately  $\frac{3}{4}$  mile of Logging Camp Creek. Columbia Land Trust (CLT) resolved access issues and closed on the 300 acre parcel in the spring of 2003.

Funding for the acquisition was provided by a SRFB grant sponsored by CLT whose preparation had been assisted by KWEP staff in 2001.

**Task B1.2. Comment on land-use actions that potentially affect fish habitat or watershed conditions.**

Technical comments were prepared for several proposed actions with potential to adversely affect stream conditions in the subbasin. This task affords an opportunity to provide input to prevent or minimize the likelihood that today's land-use actions will become tomorrow's problem. Items of note for this task include:

- Comments on proposed work on the Klickitat River that identified design deficiencies were provided to a project proponent early enough in process to avoid permitting problems later on (see Task A4.3).
- Extensive written comments were provided to WDOE on the draft Summary Implementation Strategy (SIS) for the Little Klickitat Temperature TMDL. KWEP staff attended related public meetings and coordinated development and submission of written comments for the YNFP on the final draft of the SIS.
- Attended two public meetings and provided verbal comment on proposals to convert the old Burlington Northern Railway along the Klickitat River and Swale Creek into a recreational trail (a.k.a. Rails-To-Trails). Met in-person with USFS technical staff during their scoping period to discuss technical fisheries and water-resources issues regarding the Rails-to-Trails proposal. Presented data from Swale Channel Stability Assessment (conducted during FY01 contract) as well as a summary of other anticipated adverse effects. Provided written comments to the Forest Service as part of NEPA scoping process.
- Reviewed and commented on seven chapters of the draft Level I Watershed Assessment for the Klickitat basin (associated with the WRIA30 Watershed Planning Unit).
- Reviewed relevant portions of Klickitat Energy Overlay Zone (EOZ) EIS (published in August 2003) and completed draft of fisheries and water-related comments. Final comments will be submitted in September 2003.

**Objective B2. Restore areas of degraded stream channel and/or habitat condition.**

**Task B2.1. Continue data collection and planning 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:

- Revisited sites identified during 2002 during high flow events during the winter of 2003 to observe water surface elevations. This information will be used in prioritizing work sites based on the frequency with which isolated floodplain would be inundated and available as fish habitat. An on-site meeting with representatives from the owner of the road to discuss restoration/enhancement options is anticipated for Fall 2003.

**Task B2.2. Stabilize 2200' of streambank on the Little Klickitat River between river miles 12.7 and 13.2.**

The Central Klickitat County Conservation District implemented a Washington State Salmon Recovery Grant received by Klickitat County to reduce bank erosion on the Little

Klickitat River. The design was provided by NRCS. Unfortunately, the final design ignored input by provided KWEP personnel regarding placement of several project elements and declined to incorporate of side-channel reconnection. KWEP provided in-kind labor assistance (AmeriCorps) for deploying geotextile material and revegetation. Items of note for this task include:

- SRFB-funded components of the project, including bank shaping, rock structure and rootwad installation were completed in November 2002.
- In-kind assistance provided by KWEP included installation of geotextile fabric and revegetation. Geotextile installation was completed in November. Revegetation began in November, resumed in February, and was completed in late-spring.

### **Task B2.3. Restore fish passage at the lower road crossing on Surveyors Creek.**

The YN Fisheries Program received a SRFB grant to restore fish passage at a road crossing on Surveyors Creek. Prior to construction, the creek passed through two 6' diameter corrugated metal pipes which were badly undersized. Bedload accumulation upstream of the crossing had resulted in considerable channel instability and an inlet skew >45 degrees. The crossing was overtopped during the 1996 floods. Replacement of the crossing restored access to at least 8.7 miles of perennial habitat. KWEP provided in-kind assistance by developing the design, project management, administration of the SRFB grant, purchasing materials, cultural monitoring, and implementation oversight. Items of note for this task include:

- KWEP staff finalized the design and completed the construction sub-contract in September 2002. Construction was begun and completed in October 2002. Construction involved installation of a 26' span arch culvert, two rock weirs, two rootwad revetments, 230 lineal feet of coir fabric encapsulation, and realignment of roughly 260' of stream channel (all but 60' of which were into previous channel alignments). The old culverts were left in-situ to provide hi-flow relief. All ground disturbing activity associated with culvert installation and in-channel work was paid for by the SRFB. Cut-and-fill, surfacing, and final grading for 1200' of road approaches was paid for by Yakama Forest products.
- An as-built survey was completed in early December 2002
- Over 3000 dogwood cuttings were collected and planted in April and May 2003. As anticipated, high-flows in late-January produced some channel regrade upstream of the uppermost grade controls and resulted in some bank erosion in expected locations. Rooted stock (primarily alder) was salvaged from several pieces of bank and transplanted within project area. Bed material from the regrade was transported through the structure and deposited largely at the head of the beaver pond downstream. The new culvert passed bedload and woody debris as planned, with no noticeable change in bed elevation in the vicinity of the structure. Bud-break occurred roughly one week before collection (3 weeks earlier than last year) resulting in more advanced phenology at the time of planting than is normally desired. All foliage was removed from the cuttings prior to planting.
- The site was revisited in June and August to check on plantings. Six of eight transplanted alders and an estimated 45% of dogwood livestakes had survived through the end of August. Given the coarse texture of the rooting environment and developmental stage of the cuttings at the time of harvest, we are very pleased with the survival rate.

- Final reports were completed and submitted to IAC in June 2003.

**Task B2.4. Conduct restoration activities in Klickitat Meadows.**

The YN Fisheries Program received a SRFB grant to conduct restoration in Klickitat Meadows (along Diamond Fork Creek). Presently, KWEP is engaged in planning for work at two project sites (sites 1 and 4). Site 1 is a 700' reach where a road-generated off-channel headcut is threatening to capture the active channel of the Diamond Fork. Site 4 is a 2300' reach with roughly 40% (by linear feet) bank erosion. A cutoff channel is also gradually isolating a primary meander, has significantly shortened channel length, and is contributing to upstream incision. Present conditions appear to be quite different from published anecdotal accounts (circa 1910) from before roads accessed the area or much livestock grazing was prevalent. Historic overgrazing likely changed plant community composition and floodplain conditions such that current conditions are more susceptible to bank erosion and avulsion. KWEP provided in-kind assistance by purchasing materials as well as providing planning, design, and implementation oversight. Items of note for this task include:

- The site was visited in October 2002 with five Americorps members whose services were paid by the SRFB. Topographic survey data was collected at Site 1 to facilitate design work during winter 2003. Americorps members collected seed from native hydrophytes for revegetation work to be conducted in 2003 and 2004. Americorps personnel revisited the site in June 2003 and collected and planted 1582 willow cuttings along approximately 2100 feet of streambank.
- KWEP staff developed a presentation for and met with WDNR staff in December to discuss objectives, scope, potential project sites, and discuss language for a Memorandum of Understanding (MOU).
- The MOU was prepared by KWEP staff, reviewed by YN and WDNR staff, and ultimately signed by both entities. Delays in the MOU review process resulted in delayed progression issuing the RFQ for design services. An RFP for design services was published and proposals were received from four firms. The Watershed Company was selected as the successful bidder.
- KWEP staff completed topographic survey work once snowmelt permitted access to the site in June and early July. Survey data was reduced, developed into topographic coverages in ArcInfo, and forwarded to TWC. Design was brought to the 80% level and reviewed by YN and WDNR staff. Informal discussions with NMFS and USFWS representatives occurred to assess ESA-related issues. JARPA and SEPA applications were prepared and submitted to the appropriate jurisdictions.
- The design will be finalized in September and permits are expected by mid-September. Source areas for LWD and rock collection will be marked with WDNR staff. Bid documents for the construction subcontract will be prepared and a pre-bid walk-through will be conducted in September with a contract expected to be awarded so that work can proceed the first week in October.

**Task B2.5. Conduct restoration activities associated with the Klickitat River Meadows Project.**

The YN Fisheries Program received a SRFB grant to conduct restoration along the upper Klickitat River.. The present phase of the project involves placement of five LWD jams

along roughly 4800' of river in an area known as Caldwell Prairie and five more jams along 2200' of river in an area known as Kessler's Ranch. KWEP provided in-kind assistance by purchasing materials as well as providing planning, design, and implementation oversight. Items of note for this task include:

- An RFQ for design services was published and Statements of Qualifications were received from four firms. The contract was awarded to Interfluve, Inc.
- A fit-in-the-field design approach was selected to reduce design costs and maximize funds available for construction oversight.
- Survey and hydraulic modeling of selected cross sections was completed. Design was brought to the 50% level and reviewed by YN staff.
- LWD sources will be marked with BIA Forestry personnel in September. Applicable permits are expected in early October. Bid documents for the construction subcontract will be prepared and a pre-bid walk-through will be conducted in early October with a contract expected to be awarded so that construction can proceed in early November.

**Task B2.6. Restore 1200' of stream habitat along White Creek.**

This project will restore floodplain connectivity to diminish high flows and restore low flows to this and downstream reaches. Activities during the 9/1/02-8/31/03 reporting period were to consist of planning and design. However, analysis of spawning survey data that several other reaches in the watershed (especially in Tepee Creek) are higher priorities for restoration. Thus, survey and design work has been postponed until higher priorities in the watershed have been addressed. Further planning and design on this project will be delayed until 2004 or 2005.

**Task B2.7. Replace fish passage barriers in Trout Creek watershed.**

The YN Fisheries Program received a SRFB grant to replace two culverts in the Trout Creek watershed (one on Trout Creek and one on Bear Creek). Collectively, replacement of the crossings will restore unimpeded access to roughly 9.0 miles of perennial habitat upstream of the crossings. KWEP has provided in-kind planning and design assistance. Implementation had been scheduled for fall of 2003, but has been rescheduled for summer/fall 2004 to coincide with a timber sale. Items of note for this task include:

- The project budget and contract were finalized with IAC.
- Topographic surveys were completed for both project sites. Survey data was reduced, error-checked, and imported into Arc/Info.
- Basin hydrology was developed for both sites.
- Topographic coverages (TIN and contour) were created for both work sites. Cross-sectional analysis was completed.
- Design is at 60% completion for both crossings.
- Bids were solicited and received for each of the structures.

**Task B2.8. Identify sites for revegetation along the mainstem Klickitat River downstream of RM 32.**

Flooding in 1996 and 1997 deposited extensive gravel deposits along the mainstem Klickitat River. Though woody vegetation (primarily alder) has colonized the margins of many of these deposits, most bar surfaces show no sign of natural revegetation. Many of these bars are elevated well above the surface of the two-year recurrence interval (a.k.a.

bankfull) which typically correlates to the presence of perennial vegetation. This task involved planning for revegetation of these bars, primarily, identification of project sites. Implementation is anticipated for 2004 or 2005. It is anticipated that a “stinger” and/or mechanical excavation will be required to establish cuttings and rooted stock at sufficient depth. Items of note for this task include:

- Potential bars were identified via interpretation of aerial photos. They are in the process of being field verified. Observations during a 4-year flood event in January assisted with identifying inundation frequency of sites. Though time-requirements of other tasks limited time available to this task, KWEP staff digitized potential project sites into Arc/Info.

**Task B2.9. Conduct planning and design for restoration of Swale Creek Canyon.**

The Swale Canyon Channel Stability Assessment (SCCSA; conducted during FY01 contract) identified eight major locations for restoration projects within the 13-mile long canyon portion of Swale Creek. This task involved planning and discussion with landowners, Washington State Parks and Recreation Commission (WSPRC; the responsible party for the railway), and the USFS (the prospective manager of the proposed trail). Items of note for this task include:

- KWEP staff attended three public meeting held by WSPRC and USFS. Met in-person with USFS staff to provide technical comment on fisheries and water-related issues during the NEPA scoping period. Submitted written comments as part of NEPA scoping process.
- Discussed findings of SWCSA with landowners.
- Presented SWCSA findings to representatives from the Army Corps of Engineers and discussed cost-share opportunities for restoration work.
- Presented findings of the SWCSA to Klickitat CRC.
- Presented data from SWCSA as well as a summary of other technical issues along the mainstem Klickitat River to Klickitat Trails Conservancy members in two presentations.
- The EA was issued in August 2003 and KWEP personnel reviewed relevant portions. The issues/concerns expressed by KWEP and other YNFP staff during the scoping process appeared to have been incorporated into the document. The preferred alternative excludes the segment in Swale Canyon.

**Task B2.10. Restore fish passage on Snyder Creek at the Klickitat Mill site.**

This task was originally scheduled for FY00 but was delayed because the landowner declared bankruptcy. Ownership of the property was resolved in 2002. The \$98,000 for construction contributed by KWEP is being matched with \$345,000 in SRFB Grants awarded to Klickitat County, \$80,000 from the Mid-Columbia Regional Fisheries Enhancement Group, and a \$44,000 in-kind match from WDFW. The project will restore passage through a 2600’ long concrete flume, remove a low-head dam, and replace two road crossings upstream of the flume. Once work is completed, fish passage will be restored to roughly 2.5 miles of some of the best tributary habitat in the lower Klickitat subbasin. Work funded by this project will be subcontracted to WDFW under a design-and-build agreement. Funding for this item was carried-over from the FY01 contract. KWEP-related construction is associated with replacement of the two culverts. Items of note for this task include:

- The cooperators conducted a site visit in September, confirmed respective support for the project, and agreed to subcontract design and implementation by WDFW.
- WDFW completed a BE and submitted (with BPA as applicant) for consultation with NMFS and USFWS. Concurrence with a “not likely to adversely affect” determination for Bull Trout was received from the USFWS. A formal Section 7 consultation with NMFS for mid-Columbia steelhead ended with a Biological Opinion that concluded proposed project actions would not jeopardize mid-Columbia steelhead.
- KWEP staff arranged cultural, historical, and archeological surveys for BPA-funded portions of the project. Results were submitted to the State Historic Preservation Office for concurrence. KWEP staff also completed a NEPA checklist and submitted to BPA for relevant portions of the project.
- The funding agreement was signed in early July. Cooperating parties reviewed and commented on the final design. Equipment was mobilized and construction was initiated in August. To date, work has been initiated on removal of the dam, regrading of pond sediments, and removal of the two culverts. Work anticipated to occur before weather forces seasonal suspension of construction include: complete removal of both culverts and replacement with bridges, final grading of pond sediments, installation of all log weirs, and beginning the installation of concrete weirs.

**Task B2.11. Stabilize an active headcut and restore 3000’ of the Little Klickitat River between river miles 11.3 and 11.9.**

Planning and design for this project were initiated in 2001. This task was included in the work-statement as a place-holder dependent on available staff time, continued landowner interest, as well as the ability to obtain outside funding. No activity was pursued on this task because of demands on KWEP staff time by higher priority tasks.

**Task B2.12. Assist land management planning on two parcels acquired to conserve steelhead habitat.**

Project staff assisted Columbia Land Trust acquire funding for purchasing a mile of steelhead habitat on Dillacort Creek and ¾ mile of steelhead habitat on Logging Camp Creek as well as adjacent uplands. KWEP provided cash support to develop land-use plans for addressing management issues such as road maintenance and abandonment. Items of note for this task include:

- A sub-contract with Columbia Land Trust was developed.
- Data collection associated with roads and vegetation inventory was completed in August 2003. The plan will be finalized in October 2003.

**Task B2.13. Assist ongoing meadow restoration in Snyder Swale.**

Over the last ten years, Underwood Conservation District (UCD) has spearheaded an effort to restore riparian and wetland functions in low-gradient portions of the headwaters of Snyder Creek (a.k.a. Snyder Swale). Though these reaches are non-fish bearing, these low-gradient reaches are critical groundwater recharge areas that important to the anadromous-bearing portion of Snyder Creek. The current phase involved rerouting streamflow up to the 10-year event into the 1175’ long historic channel around a 925’ long reach that is incised up to 6’. KWEP provided in-kind support in the form of materials (geo-grid) as

well as survey and design assistance. Project management and implementation costs and services were provided by UCD. Items of note for this task include:

- KWEP staff completed survey and design work in September 2002 and conducted a pre-construction walk-through with UCD staff to go over design and implementation issues.
- Americorps personnel supervised by UCD staff completed implementation in November 2002.
- Assisted UCD staff install two piezometers and two permanent benchmarks in January. KWEP staff surveyed piezometer and benchmark elevations to assist effectiveness monitoring of project related groundwater elevation completing the YN/BPA role in the project.

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

**Objective C1. Monitor site-specific habitat conditions.**

Habitat unit, LWD, and reference point data on in-stream habitat was collected in cooperation with the Klickitat Monitoring & Evaluation Project personnel to document baseline conditions on six reaches. Channel morphology and substrate data collected as part of the design process for B2 tasks can be used for post-project monitoring in the future.

- Assisted spawning surveys on four steelhead spawning tributaries.
- Six TFW segments were inventoried: five in the White Creek watershed and one on Diamond Fork Creek.

**Objective C2. Monitor basinwide habitat conditions.**

Monitoring of streamflow, temperature, and substrate were conducted at several fixed locations throughout the basin to facilitate evaluation of basinwide response upstream conditions and identify further needs at a watershed-scale. The Klickitat Monitoring & Evaluation Project has the primary responsibility for these efforts, but KWEP personnel assisted as follows:

- KWEP staff assumed responsibility for managing thermographs and analysis of temperature and sediment data. Technicians from the YKFP M&E project will still have the primary responsibility for deployment and retrieval. Thermographs for all 31 sites were retrieved, downloaded, and relaunched. Data was imported into the temperature database.
- Flow measurements were taken on the following streams (# of measurements): Bear Creek (1), Diamond Fork Creek (1), Klickitat River @ Cow Camp (1), Little Klickitat River (3), Summit Creek (1), Surveyors Creek (1), Swale Creek (4), Trout Creek (2), and White Creek (2).
- A crest gage was installed at the Swale Creek
- Rating curves were developed for the Little Klickitat, Summit Creek, Trout Creek, Swale Creek, and White Creek gages.