Yakima Tributary Access and Habitat Program

**Annual Report
2002 - 2003**

This Document should be cited as follows:

Myra, D., C. Ready, "Yakima Tributary Access and Habitat Program", 2002-2003 Annual Report, Project No. 200202501, 70 electronic pages, (BPA Report DOE/BP-00011926-1)

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P.O. Box 3621
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This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views in this report are the author's and do not necessarily represent the views of BPA.

Yakima Tributary Access and Habitat Program

Annual Report

December 2003

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Prepared for:

The U.S. Department of Energy
Bonneville Power Administration
Project 2002-025-01

EXECUTIVE SUMMARY

The Yakima Tributary Access and Habitat Program (YTAHP) was organized to restore salmonid passage to Yakima tributaries that historically supported salmonids and to improve habitat in areas where access is restored. This program intends to a) screen unscreened diversion structures to prevent fish entrainment into artificial waterways; b) provide for fish passage at man-made barriers, such as diversion dams, culverts, siphons and bridges; and c) provide information and assistance to landowners interested in contributing to the improvement of water quality, water reliability and stream habitat.

The YTAHP developed from a number of groups actively engaged in watershed management, and/or habitat restoration within the Yakima River Basin. These groups include the Washington State Fish and Wildlife (WDFW), Kittitas County Conservation District (KCCD), North Yakima Conservation District (NYCD), Kittitas County Water Purveyors (KCWP), and Ahtanum Irrigation District (AID). The US Bureau of Reclamation (Reclamation) and Yakama Nation (YN) both participated in the development of the objectives of YTAHP. Other entities that will be involved during permitting or project review may include the YN, the federal Natural Resources Conservation Service (NRCS), the US Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), and US Army Corps of Engineers (COE).

The objectives of YTAHP are listed below and also include subtasks detailed in the report:

1. Conduct Early Action Projects
2. Review Strategic Plan
3. Restore Access, including stream inventory, prioritization, implementation
4. Provide opportunities to improve habitat and conserve resources

The BPA YTAHP funding supported activities of the program which are described in this report. These activities are primarily related to objective 1 (conduct early action projects) and parts of objectives 2-4.

The work supported by YTAHP funding will support a series of scheduled projects and be made larger by complementary funding through NRSC EQIP, Irrigation Efficiencies, WA State Salmon Recovery Funding Board and other local, state and federal programs.

Projects completed FY-03:

The Cooke Creek siphon and screen/bypass was completed on time and within budget.

The Rosbach Farms project was completed in cooperation with the NRCS Environmental Quality Incentives Program and the KCCD's Irrigation Efficiencies Program.

Tributary survey teams were trained and surveys of tributaries in Yakima and Kittitas counties commenced in December of 2002. By the end of September 2003 Cowiche Creek in Yakima County was completed as well as Coleman, Reecer, Currier, Dry, Cabin, Indian, and Jack Creeks in Kittitas County.

A screen was installed on the Hernandez/Ringer diversion in cooperation with the NRCS office in Kittitas County.

YTAHP submitted six applications to the Salmon Recovery Funding Board and three were selected and funded. Another Salmon Recovery Funding Board project awarded in 2000 to the Yakama Nation was transferred to the KCCD.

Two miles of fencing of riparian zones on the north fork Ahtanum was completed by the North Yakima Conservation District in cooperation with the Department of Natural Resources and the Ahtanum Irrigation District and funded by US fish and Wildlife as part of YTAHP's outreach partnering.

Completion of this year's effort has provided significant inroads to working on the private lands in two counties which will be vital to future efforts by YTAHP and others to protect and enhance Yakima River Basin habitat.

2003 saw the migration of the WEB site from MWH to the Kittitas County Conservation District and can be accessed at www.kccd.net.

ACKNOWLEDGEMENTS

The successful execution of this project is due in large part to the cooperation and participation of many people including particularly the following:

David Byrnes, Bonneville Power Administration
R. Dennis Hudson, U.S. Bureau of Reclamation
Kate Puckett, U.S. Bureau of Reclamation
George Marshall, Ahtanum Irrigation District
Anna Lael, Kittitas County Conservation District
Abbi Sorensen, Kittitas County Conservation District
Rusty Gigstead, Kittitas County Conservation District
Suzanne Wade, Kittitas County Conservation District
Sara Bull, Kittitas County Conservation District
Mike Tobin, North Yakima Conservation District
Dave Nunn, North Yakima Conservation District
Stephen Kropp, Washington Department of Fish and Wildlife
Pat Schille, Washington Department of Fish and Wildlife
Eric Egbers, Washington Department of Fish and Wildlife
Richard Visser, Washington Department of Fish and Wildlife
Scott Nicolai, Yakama Nation, Yakima/Klickitat Fisheries Project
Hank Fraser, Yakima Nation, Safe Passages
William R. Hinkle, SCW RC&D & Kittitas County Commissioner (former)
Ron Gamache, SCW RC&D & Yakima County Commissioner

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LIST of ACRONYMS

ACOE/COE	US Army Corps of Engineers
AID	Ahtanum Irrigation District
BLM	US Bureau of Land Management
BPA	Bonneville Power Administration
BOR	US Bureau of Reclamation
cfs	cubic feet per second
CREP	Conservation Reserve Enhancement Program
CWA	federal Clean Water Act
Ecology	WA Department of Ecology
EPA	US Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
HPA	Hydraulic Project Approval
JARPA	Joint Aquatic Resources Permit Application
KCCD	Kittitas County Conservation District
KCWP	Kittitas County Water Purveyors
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NYCD	North Yakima Conservation District
RC&D	So. Central WA Resource Conservation and Development Council
SFRB	Salmon Recovery Funding Board
SEPA	Washington State Environmental Policy Act
USFS	United States Forest Service
USFWS	United States Fish & Wildlife Service
WDFW	Washington Department of Fish and Wildlife
YTAHP	Yakima Basin Tributary Access and Habitat Program
YN	Yakama Nation

YAKIMA TRIBUTARY ACCESS and HABITAT PROGRAM

1.0 INTRODUCTION

This report covers activities conducted by the Yakima Tributary Access and Habitat Program under BPA grant project #2002-025-01 for fiscal year 2003. The Yakima Tributary Access and Habitat Program (YTAHP, Program) was organized to restore salmonid passage to Yakima River tributaries that historically supported salmonids and improve habitat in areas where access is restored. The program was developed to screen unscreened diversion structures to prevent fish entrainment into artificial waterways; provide for fish passage at man-made barriers, such as diversion dams, culverts, siphons and bridges; and provide information and assistance to landowners interested in contributing to the improvement of water quality, water reliability and stream habitat. Figure 1 presents the Yakima and Kittitas portions of the Yakima River.

The YTAHP developed from a number of groups actively engaged in watershed management, and/or habitat restoration within the Yakima River Basin. These groups included the US Bureau of Reclamation (Reclamation, US BOR), Washington State Fish and Wildlife (WDFW), Kittitas County Conservation District (KCCD), North Yakima Conservation District (NYCD), Kittitas County Water Purveyors (KCWP), Ahtanum Irrigation District (AID) and the South Central Washington Resource Conservation and Development Council (RC&D). The Yakama Nation (YN) also participated in the early stages of the program's development and ongoing coordination. Collectively, the WDFW, KCCD, NYCD, KCWP, AID and RC&D are referred to as the core team.

This report covers YTAHP activities funded by BPA in FY03 (October 1 2002-Sept 30 2003). These activities primarily reflect YTAHP efforts to plan, engineer and implement Early Action Projects (EAP) and conduct tributary surveys as outlined in the YTAHP Strategic Plan.

2. BACKGROUND

Native salmon populations in the Yakima River Basin have declined from historic levels. The significance of these declines is reflected in recent listings under the Endangered Species Act (ESA). The Middle Columbia River steelhead evolutionarily significant unit, which includes the Yakima Basin, was listed by National Marine Fisheries Service (NMFS, now National Oceanographic and Atmospheric Administration (NOAA) Fisheries), as threatened under the ESA on March 25, 1999 (64 FR 14517). The U.S. Fish and Wildlife Service (USFWS) listed the Columbia River bull trout distinct population segment, including the Yakima Basin, as threatened on June 10, 1998.

Several planning and recovery documents covering the Yakima River Basin list barrier removal and diversion screening as needed to support fish recovery, including the Yakima Subbasin Summary, Yakima Limiting Factors Analysis, federal Biological Opinions and watershed plans. Habitat quality is also identified as a key factor limiting the productivity of these listed species.

There has been active screening of Yakima River mainstem diversions for nearly 20 years through the Fish Passage and Protective Facilities Program, a cooperative effort lead by the

Figure 1. Yakima River Basin, WRIA 37 (Yakima) and 39 (Kittitas).

Bureau of Reclamation with BPA Fish and Wildlife Program funding, Phase I (1980s) and Phase II (1990s to present).

In spite of these significant past efforts, there are still many unscreened diversions and other passage and habitat challenges for fish in the Yakima Basin tributaries. There may be more than 500 barriers to passage, ranging from complete passage barriers to minor impediments. The YTAHP was designed to continue to address screening and passage needs in the basin using a well coordinated, prioritized approach.

3. PROGRAM OVERVIEW

The YTAHP was organized to restore salmonid passage to Yakima tributaries that historically supported salmonids and to improve habitat in areas where access is restored. This section describes the entire YTAHP program with emphasis on Action Plan FY03 funded activities. Program elements described below are: program organization, planning and project prioritization, permitting, engineering, communications, monitoring and funding. Section 4 lists specific YTAHP objectives, progress and accomplishments supported by Action Plan funding.

Program Organization

The YTAHP takes advantage of the local, state and federal parties with interest and experience in fish enhancement activities, water management and/or farm stewardship. The RC&D joined the core team as a logical choice for program administrator, as it addresses natural resource and economic needs in the entire Yakima Basin. The administration of BPA funding will be through the RC&D, with participating core members vouchering the RC&D for program related expenses. The core team members will work with the RC&D on program management and be instrumental selecting projects, overseeing permitting, engineering services and communications. Other grants relating to YTAHP project may be through the RC&D, core team members or project proponents, such as municipalities, irrigation districts or individuals.

Engineering support came primarily from Montgomery Watson Harza (MWH), but also by local engineers, conservation district engineers or by project cooperators. Communication with entities outside the core team, including the NMFS, USFWS, COE and YN was ongoing and addressed program progress and individual projects. Additional funding was sought through various programs.

Core team members with a tradition of local assistance (conservation districts and irrigation interests) worked with local project proponents and acted as liaison with regulatory agencies, funding entities and engineering service providers on projects, stream assessments and community outreach. The conservation districts also assisted in coordinating complementary programs such as irrigation efficiencies, environmental quality incentives program (EQIP), conservation reserve and enhancement program (CREP), etc.

The program is organized into five functional areas: administration, program management, regulatory compliance, engineering and technical support, and tributary projects. The groups working in these areas are labeled teams, workgroups or committees, as seems appropriate. See Table 1 and Figure 2. A liaison group for addressing permitting may also be created, however the YTAHP does not have direct oversight of this group (shaded box on Figure 2).

1. Administration	RC&D
2. Program Management	Core Team
3. Regulatory Compliance	Permits and Approvals Team
4. Engineering and Technical Support	Technical Workgroup, or TWG
5. Tributary Projects	Tributary Teams

In addition to the core team, other entities involved during permitting, water right verification or project review stages include the USFWS, NMFS, COE, Washington Department of Ecology (Ecology), NRCS, YN and others. The cooperative nature of this program and collaborative approach was intended to accelerate permitting and thereby completion of early action and subsequent projects.

Planning and Project Prioritization

A YTAHP Strategic Plan was drafted by core team members prior to grant funding of the program. This plan is a work in progress and provides framework for the YTAHP process, including scope, organization, communication, stream surveys, barrier prioritization method, project implementation and funding options. As information is developed, individual tributary plans will be prepared and identify potential projects for each tributary based on the prioritization method. Individual project plans would then define permitting, engineering, scheduling and costs for individual projects.

Funding for FY03 supported the development of 11 early action projects, including planning, permitting, engineering support, procurement and implementation. Prioritization of remaining barriers will occur in subsequent years and will be done in a systematic manner by the YTAHP using and existing WDFW barrier prioritization manual. The program will inventory barriers and rank them based on meaningful parameters, creating a prioritized project list which will be implemented when funded.

Permitting

Compliance with necessary permits and environmental review processes is addressed in several ways. For early action projects individual environmental assessments or checklists were submitted to review agencies. As the program develops, a programmatic approach will be pursued where feasible to collectively address permitting needs and reduce permit review time. Agency permit reviewers will be invited to participate in ongoing project development, permit and engineering review to accelerate the process.

In 2002, NMFS was consulted in advance of specific projects to better understand ESA consultation requirements and to share information and ideas on YTAHP and how to facilitate the permit process.

Engineering Services

A key component for projects is engineering services including skilled designs, procurement of materials, scheduling and construction oversight. The YTAHP utilized an existing service contract MWH has with BPA for such engineering services, as well as the KCCD's engineer, Rusty Gigstead. MWH engineering and procurement tasks were directed by the core team and

RC&D. MWH provided engineering services including design, plan review of designs created by others, job cost estimates, procurement services as well as construction scheduling, contracting and construction oversight where applicable. MWH will generally be the engineer of record, with responsibility for quality assurance. MWH worked with WDFW, NMFS and others to design for individual project needs. As possible, standard designs may be developed to reduce costs where uniform designs will meet multiple needs. KCCD's engineer provided design and engineering, job cost estimates, and considerable assistance with the permitting process. Two of the EAPs were very near the final design phase by the end of FY2003.

Communication

Communication is vital to the success of the YTAHP. Communication included outreach to local communities in the program area to inform about available assistance and to request access for stream surveys; coordination with other groups working on fish enhancements, conservation and land management in the Yakima Basin; and collaboration with others where project integration is beneficial and mutually agreeable. Effective communication is intended to avoid duplication of effort and parlay available funding to greater watershed benefits. Outreach will be multifaceted and be made through meeting presentations, printed materials, local media, local agricultural groups and workshops, tours, and one to one contacts with local landowners.

Monitoring

The core team and RC&D will examine the progress of the program and compare it with desired outcomes. The program and its projects monitored for their effectiveness is achieving their intended goals. The monitoring program will address whether projects are being implemented efficiently and effectively; how effective are individual projects in treating fish passage problems; and whether program implementation expanding fish distribution across the Yakima basin. The latter will be achieved by working with other basin experts to evaluate screen effectiveness and review fish distribution in the watershed.

Funding

The YTAHP's first year (FY01) was supported by individual agencies and entities who recognized the need for ongoing tributary work. The BPA Action Plan supported the YTAHP during its second year (FY02). BPA is funding FY03 activities through the Provincial Review process. In addition, other funding sources are being pursued, including WA State Salmon Recovery Funding Board, Fisheries Restoration and Irrigation Mitigation Act, and other cost share programs through the Natural Resource Conservation Service and State Conservation Commission.

Figure 2. Yakima Tributary Access and Habitat Program Organizational Chart.

Table 1. Yakima Tributary Access and Habitat Program Roles and Responsibilities.

Role	Membership^{1,2}		Responsibilities
Administration	RC&D		Grant administration, accounting, invoice preparation, coordinating with Program Manager on budget tracking and project updates for grantor(s), reporting.
Program Management	RC&D WDFW KCWP KCCD NYCD AID		Program organization and schedules, assigning tasks and tracking progress, program consistency, forming partnerships, updating the strategic plan, producing applications for funding, finding and organizing technical support, producing the program annual plans, producing the tributary plan outline that states the basic requirements of each tributary plan, determining when to refer items to the permit team, review of tributary plans, and other functions as necessary.
Permits and Approvals	WDFW KCWP KCCD NYCD AID	NMFS USFWS COE Ecology (BOR)	Preparation of environmental documents and site visits for environmental evaluation purposes. This team may assist in obtaining funds to implement the overall program. Project proponents or their representatives may also participate.
Engineering and Technical Support	WDFW KCWP KCCD NYCD AID (MWH)	NMFS USFWS COE Ecology (BOR) (YN)	The technical workgroup will perform the engineering design work and provide technical assistance on screens and barriers, including materials and contract specifications. Maintenance of GIS information and data base. Project proponents or their representatives may also participate.
Tributary	KCCD NYCD KCWP AID Local Stakeholders Individual Irrigation Entities Trained Interns Other affected parties	NRCS (YN)	The tributary teams will perform the bulk of the project planning, local outreach and implementation work, and maintenance of data bases and maps. Trib Teams may manage surveys. The tributary teams will also be responsible for most of the habitat enhancement work, including on-farm water use efficiency and riparian modifications. The NRCS may assist in these efforts also.

5. SCOPE of WORK and FY03 ACCOMPLISHMENTS

To meet the objectives of the Yakima Tributary Access and Habitat Program the following key objectives were pursued to identify and implement several early action items; establish a systematic approach to identifying barriers and projects basin-wide through stream assessments and a priority setting process; and taking advantage of opportunities to improve habitat where possible.

OBJECTIVE 1: Implementation/Construction of items related to Early Action Process

Task 1– Initial contact was made with landowners/irrigation entities to confirm water rights and prepare initial permitting and engineering.

Accomplishments: Initial contact has been made with land owners. Two hundred twenty three (223) mailings were made to land owners on Cowlitz Creek and hundred seventy (170) mailings were made on Ahtanum Creek. The mailings introduced and described the program, assessment process and provided contact information. There were twenty five (25) on site or in person contacts on Cowlitz Creek. As the stream survey continues more diversions have been identified. Confirmation of water rights were researched and documented. The Biological Assessments on the early action items were completed for the submittal to the Salmon Recovery Funding Board.

Task 2– Prepare or finalize engineering designs and submit or confirm permits.

Accomplishments: Engineering, design and permitting were completed on six projects for submittal to the Salmon Recovery funding board. Three of the projects were selected and funded. The NYCD project at Diversion 14 on Ahtanum Creek was funded by SRFB for \$199,000. Coleman Creek sponsored by KCCD was funded for 101,744 and the Dry/Cabin Creek project was funded for \$164,051. These projects are being matched by FY 02 YTAHP funds (engineering/design and procurement of rock, pipe, screens, etc. The WDFW/Cowlitz Canyon Conservancy application to SRFB for the Snow Mt Ranch was provisionally funded. Final engineering on Cooke Creek was completed. All necessary permits were obtained on Cooke Creek. Engineering on the Dry/Cabin and Coleman Creek projects progressed after the SRF funds were secured. The process of applying for permits was initiated for both projects.

Task 3– Manufacture/construct/purchase screens and initiate operation of facilities:

Accomplishments: Of the five projects identified four were completed: Diversion 13, pump screen at 5 locations, the bypass and screening at Cooke Creek and the pipe installation on the Rosbach projects were all completed on time and within budget. The Fines project was not able to proceed for two reasons, 1) funding and (2) land owner issues. The Buchanan Ranch project on Wenas Creek included planning, implementation, monitoring. BMPs implemented included Riparian planting (4,450 plants), fence abandonment (1/2 mile) and weed abatement. Two fish barriers were corrected/removed. Funding was secured through the SRFB.

The North Fork Ahtanum Creek fencing project constructed 2 miles of livestock exclusion fencing around critical Bull Trout Habitat. \$16,473.01 of state, local and federal funding was secured to implement the project.

The Roy Project involved planning, implementation, monitoring and planting of 4,000 plants the Yakima River Gap reach, 1.5 miles of fence abandonment. Funding was secured for \$25,000 in FY 03 and \$35,000 for FY04-05 from local and state sources.

The Hernandez/Riger installation occurred, but is not functional because of the NRCS design. The pump intake is too close to the screen and when it is pumping, it is sucking the bubbles that should be working to clean the screen. The screen is scheduled to be removed as part of the Coleman Creek Project that secured SRF funding. The screen will be replaced by a CTC pump screen. The Eslinger screen did not move beyond the initial planning by NRCS. It appears now that none of the screens procured from the Screen Shop will fit in this site.

OBJECTIVE 2: Complete Strategic Plan for Yakima Tributary Access and Habitat Program

Task 1- Distribute Strategic Plan

Accomplishments: The strategic plan was distributed to participating entities and stakeholders.

Task 2– Update Strategic plan as needed.

Accomplishments: The strategic plan was reviewed.

OBJECTIVE 3: Restore Salmonid Access

to tributaries that historically supported those species, remove barriers and screen diversion structures to prevent entrainment into artificial waterways.

Task 1- Prioritize tributaries based on existing data (watershed and subbasin planning, etc).

Accomplishments: Tributaries in Yakima and Kittitas counties were prioritized and scheduled for surveys in cooperation with the Yakama Nation and WDFW and the review of existing data.

Task 2– Conduct surveys in tributaries to identify and locate barriers.

a) Create survey teams

Accomplishments: Survey teams were created in Kittitas and Yakima Counties.

b) Train survey teams per SSHEAR Protocol

Accomplishments: Survey teams were trained in November 2002 per SSHEAR Protocol.

c) Conduct systematic surveys of Yakima river tributary barriers.

Accomplishments: 115 miles of tributary survey work was completed. A draft report on Cowiche Creek was completed and is in the process of being proofed by a review team.

d) Troubleshoot survey process as needed.

Accomplishments: The survey process was hampered by high flows creating a hazardous environment for in-stream work,. Addition safety equipment for personnel was acquired. The equipment needs were under estimated and additional equipment was acquired to facilitate the in-stream work.

e) Re-prioritize list of Yakima River tributary barriers for use as a guide for conducting enhancement activities.

Accomplishments: This task is in process awaiting compilation of data compiled during the stream surveys.

Task 3– Develop tributary teams and tributary work plans to address identified barriers for each tributary.

- a) Create tributary team and establish roles and responsibilities for members.
Accomplishments: Format developed for implementing tributary teams.
- b) Tributary team to review survey information.
Accomplishments: In process.
- c) Tributary team to create tributary work plan including individual projects within tributary.
Accomplishments: In process.

Task 4– Implement each tributary work plan.

- a) Create project work plans for each identified barrier project.
Accomplishments: In process.
- b) Draft permit applications, submit with completed engineering design.
Accomplishments: In process.
- c) Conduct engineering review and prepare design.
Accomplishments: In process.
- d) Prepare contracting documents as needed.
Accomplishments: In process.
- e) Construct and install.
Accomplishments: In process.
- f) Troubleshoot as needed, track problems, constraints and responses.
Accomplishments: In process.
- g) O/M on installed facilities (~ by users).
Accomplishments: In process.

Task 5– Monitor project to ensure effectiveness, consistency with program goal and regulatory requirements.

- a) Monitor the installation to evaluate effectiveness of program and projects.
Accomplishments: In process.
- b) Prepare brief status report annually to include projects completed, projects underway, project monitoring, troubleshooting outcomes.

Objective 4: Provide Opportunities to Improve Habitat

including water quality, water reliability and stream habitat in project areas for landowners with identified barrier removal and screening needs. Landowner participation is voluntary.

Task 1– Provide outreach and educational opportunities to participating landowners relative to improving water quality, water reliability and stream habitat.

- a) Conduct outreach efforts such as press release, public meeting, providing speakers to grower groups existing newsletters, internet web site, and other venues.
Accomplishments. Brochures, press releases, newsletter articles, speaking engagements and meeting were held describing the goals and benefits of YTAHP. NYCD presented the YTAHP program to the Yakima Audobon Society. The KCCD published two newsletters with a circulation of 1,326 as well as articles about YTAHP in the Ellensburg Daily Record (circulation 5,000) and the Conservation Edition of the Grange News (circulation 70,000). The KCCD hosted or attended four local grower meetings with total

attendance of 360 and staffed a booth at the Kittitas County Fair that included information about YTAHP (attendance 61,000).

- b) For specific tributaries, conduct in-person outreach and education and offer on-site reviews and consultations about options best suited to individual operation.

Accomplishments: 25 in-person contacts were made about site specific unscreened pump and barrier issues by the NYCD. More than 400 letters have been mailed to landowners adjacent to streams in Kittitas County. In addition to requesting permission to access their property, the letters also included information about YTAHP and the stream assessment process, and offered technical assistance directly to the landowner to address resource concerns associated with their property.

Task 2- Provide technical assistance specific to individual land owner needs regarding improvement of water quality, water reliability and stream habitat.

- a) For interested individuals, provide technical assistance to create a plan to implement improvements, such as NRCS farm plan, mapping, data gathering ideas (soil moisture, other), piping, irrigation methods, etc.

Accomplishments: NYCD worked with one land owner regarding buffers and vegetation planting on Cowiche Creek. The KCCD worked with several water right holders to determine needs and potential solutions. Those landowners include Rosbach Farms on Cooke and Caribou Creeks, the Eaton Family on lower Wilson Creek, five families on upper Naneum Creek, Ringer/Hernandez/Bull Ditch project on Coleman Creek, Hillcrest Farms on Coleman Creek, Taylor family on Dry Creek, Scott family on Dry Creek, Baesler Family on the Teanaway River, and the Manastash water users. Varying levels of assistance were provided including field data collection, GIS maps, engineering and design, and project cost estimation were provided to all of the landowners.

- b) Provide follow-up communication to determine interest level to proceed to Task 3.

Accomplishments: All of the families/groups in Kittitas County were interested in moving toward receiving financial assistance. Some of the landowners found other sources of funding for construction but requested continuing technical assistance.

Task 3– Provide financial assistance for individual landowner needs regarding improvement of water quality water reliability and stream habitat. The financial assistance program under this task will be implemented in cooperation with BPA and only after prior agreement has been reached with BPA regarding the terms and conditions of any financial assistance payments charged to this contract.

- a) For interested individuals, assist with gaining financial assistance to implement on-farm improvements determined to be appropriate and feasible in task 2, above. Grower shall have flexibility in selecting from a menu of options.

Accomplishments: The KCCD completed the Rosbach Farms project in mid 2003. The project consisted of converting 350 acres of rill irrigated cropland to sprinkler irrigation systems. The addition of the sprinkler increased efficiencies enough to allow for 1 cubic foot per second of saved water to remain in Caribou Creek. In addition to the sprinkler systems, the project included piping irrigation water delivery ditches, abandoning two diversion sites and structures and providing fish screens at two other diversion sites on

Cooke and Caribou Creeks. The total project cost was approximately \$550,000. YTAHP contributed approximately 6% of the project cost.

The Eaton project on Lower Wilson Creek had been in the planning stages for approximately 4 years. It was originally a Yakama Nation project intended to be funded by BPA and the Salmon Recovery Funding Board. Problems with budgets, project costs and timing resulted in a loss of the needed BPA funds. The landowner contacted the KCCD and the NRCS for assistance. We were able to secure funding through the Environmental Quality Incentives Program (EQIP) and the Irrigation Efficiencies Program (\$142,000) for the project. The Yakama Nation transferred sponsorship of the SRF grant (\$108,000) to the KCCD. The project began construction in September 2003 and is scheduled for completion by in early 2004. YTAHP's direct contribution to this project will be only through a minor amount of KCCD staff time for engineering, etc.

The families that irrigate with water from upper Naneum Creek were very interested in funding. KCCD and NRCS estimations placed the cost of the piping and consolidation project at over \$1 million. The landowners secured \$220,000 in EQIP funds, but an application by the KCCD to the Salmon Recovery Funding Board was not accepted and the Irrigation Efficiencies program would not fund the project because of the distance from the Yakima River and the number of unscreened and impassable diversions in that 13 mile reach. Because no matching funds were available, the landowners did not enter into an EQIP contract.

The Hernandez/Ringer/Bull Ditch project on Coleman Creek will be receiving construction and implementation funds from a successful Salmon Recovery Funding Board grant as well as YTAHP in FY04. The project will remove a perched culvert and add control structures to Bull Ditch in order to prevent fish entry into the canal system. Work was completed in FY03 to finalize project designs and begin the permit application process.

The Hillcrest farms project on Coleman Creek is tied to the Hernandez/Ringer/Bull Ditch project. Hillcrest is the landowner directly upstream and adjacent to the project site. The landowner is interested in riparian enhancements. YTAHP FY04 funds are set aside to assist with the tree plantings and maintenance.

The Taylor project on Dry and Cabin Creeks is also receiving funding from a Salmon Recovery Funding Board grant, as well as the Environmental Quality Incentives Program through NRCS. This project will correct passage and screening issues, and increase water use efficiencies.

The Manastash water users have worked with the KCCD since May, 2000. Together with the Washington Environmental Council, they secured \$2.24 million in funding to implement "Phase I". KCCD staff assisted the landowners in organizing and preparing to administer the funds. YTAHP funds will only continue to be involved in the form of coordination between the Manastash Project and YTAHP.

b) Provide follow-up communication to determine progress on implementation. This will assist grower as well as be used for reporting and monitoring purposes.

Accomplishments: The Rosbach project is fully implemented. The landowner is satisfied with the results and working to learn a new irrigation system. The Eaton project construction is underway. All of the other projects that have secured funding are in the planning stages with construction predicted in 2004.

5.0 SUMMARY and FUTURE YTAHP ACTIVITIES

Overall, the Yakima Tributary Access and Habitat Program has achieved important enhancements that support aquatic species in a short period of time. The involvement of local conservation and irrigation entities as well as communication with local elected representatives has broadened the awareness of the program and enhanced its ability to achieve its objectives. In addition, the program accomplishments will leverage subsequent work through the engineering designs, procured materials and general cost share that this program has provided. Additional grant applications have been or will be made to further support program objectives.

The program was able to establish the personnel and equipment for beginning the stream assessment process on tributaries in Yakima and Kittitas Counties. The stream assessments will identify the number and location of barriers and help to guide overall project selection and implementation.

Future work that will use the FY03 as a foundation include separating two creek-canal intersections, installation of properly screened diversions, both pump and gravity, removal of various fish passage barriers and on-farm irrigation improvements. The program will also supplement work done under other local, state and federal programs that support farm and environment projects.

Completion of this year's effort has provided significant inroads to working on the private lands in two counties which will be vital to future efforts by YTAHP and others to protect and enhance Yakima River Basin habitat.

REFERENCES

Biological Opinion, Reinitiation of Consultation on Operation of the Federal Columbia River Power System, Endangered Species Act-Section 7 Consultation. National Marine Fisheries Service, December 21, 2000.

Limiting Habitat Factors, Yakima River Watershed, Final Report. Washington State Conservation Commission, December 2001.

Yakima River Basin - Watershed Assessment. Tri-County Water Resources Agency, June 2000.

Yakima Subbasin Summary (draft). Northwest Power Planning Council, August 3, 2001.

Project Number 2002 - 025 - 01

Yakima Tributary Access and Habitat Program Phase 2

October 1, 2002 through September 30, 2003

Background

Phase 2 of this project represents the second year of activity under this project. The first year was funded under BPA's Action Plan and carried the project number 2002-025-00. Due to the need to separate the accounting for this project between Action Plan and the Columbia Plateau, a new project number and associated BPA work order had to be created.

Implementation of the actions incorporated in this statement of work will be closely coordinated with the fisheries co-managers within the Yakima River Basin, i.e., Washington Department of Fish and Wildlife and the Yakama Nation.

***Goal:** To restore fish access to Yakima River tributaries that historically supported anadromous salmonids, but are currently blocked due to passage barriers; to improve habitat as possible.*

Objective 1: Implementation/Construction of Items Related to Early Action Process

previously identified as priority issues and which may have agreed biological priority and/or extraordinary opportunity.

Task 1 – Ongoing contacts with landowners/irrigation entities re barriers and screens, engage in discussions and agreements as necessary, confirm status of water right, prepare submittal for engineering team, and draft applicable permits.

Deliverable – Expand list of interested individuals, preliminary information on barriers, initial permitting and engineering prepared. General idea of number of interested parties in the basin.

Task 2 – Prepare or finalize engineering designs and submit or confirm permits. There will likely be projects in excess of what can be accomplished in 2003

Deliverable – Pursue further funding/permitting for the (11) projects delivered by Montgomery, Watson & Harza (MWH) through EAP. Five applications will be prepared for SRFB funds.

Task 3 – Manufacture/construct/purchase screens and install and initiate operation of facilities. Operation of facilities may begin following installation or wait until the following year's water use season.

Deliverable – Construction will proceed on the following projects:

1. Fines Project on Wide Hollow Creek.
2. Diversion #14 on Ahtanum Creek.

3. Pump Screen Installations at (5) locations.
4. Bypass and Screening at Cooke Creek.
5. Pipe Installation on Rosbach Project

Objective 2: Complete Strategic Plan

for Yakima Tributary Access and Habitat Program.

Task 1 – Distribute, as appropriate to participating entities and others. Elected officials, agency heads, etc informed of program and Strategic Plan that guides the program.

Deliverable – Strategic Plan distributed to participating entities and stakeholders.

Task 2 – Update, as needed, to include new project information, available scientific findings or other pertinent information. Supplemental sheet may be satisfactory rather than a complete revision of document.

Deliverable – Strategic Plan is reviewed annually and supplemented or amended, as deemed appropriate.

Objective 3: Restore Salmonid Access

to tributaries that historically supported those species, remove barriers and screen diversion structures to prevent entrainment into artificial waterways.

Task 1- Prioritize tributaries based on existing data (watershed and subbasin planning, etc).

a) Existing information source(s) for prioritization, organized as possible to assist in understanding and evaluating information.

Deliverable – Organized compilation of existing information on Yakima River tributaries.

b) Review of existing data by participating entities to evaluate voracity and quality of information and establish a preliminary prioritization based on existing data. Questionable data will be used with caution or discarded.

Deliverable – Critical review of existing data.

Task 2- Conduct surveys in tributaries to identify and locate barriers.

a) Create survey team(s) and establish roles and responsibilities. Individuals may serve on more than one team. (Survey teams may be a subset of the Tributary Team, see below.)

Deliverable – Individual survey teams and roles and responsibilities established.

b) Train Survey Teams per SSHEAR salmon habitat assessment protocol to ensure expertise and cross team consistency in assessment.

Deliverable – Survey Teams are trained in consistent salmon habitat assessment protocol.

c) Conduct systematic surveys of Yakima River tributary barriers, with results documented in organized fashion (database), digital or other images and preliminary measurements included where possible.

Deliverable – Information gathered in relation to barriers and access issues will be entered into the database constructed by MWH in 2002 project efforts.

d) Troubleshoot survey process, as needed.

Deliverable – Survey protocol critically evaluated and amended as needed.

e) Re-prioritized list of Yakima River tributary barriers for use as guide for conducting enhancement activities..

Deliverable – Re-prioritized list of Yakima River tributary barriers.

Task 3– Develop tributary teams and tributary work plans to address identified barriers for each tributary.

a) Create tributary team and establish roles and responsibilities for members.

Deliverable - Established tributary teams.

b) Tributary team to review survey information.

Deliverable - Review of tributary survey data.

c) Tributary team to create tributary work plan, incl. individual projects within tributary.

Deliverable - Tributary Work Plans that describe barriers and schedule of projects.

Task 4- Implement each tributary work plan.

a) Create Project Work Plans for each identified barrier project.

Deliverable - Individual Project Work Plans.

b) Draft permit applications, submit with completed engineering design.

Deliverable – Initial Permit Applications, preliminary Engineering Designs.

c) Conduct engineering review and prepare design.

Deliverable – Final Engineering Designs.

d) Prepare contracting documents, as needed.

Deliverable – Contract documents

e) Construct and Install.

Deliverable – Barrier corrected, installed screen, fishway or other facility.

f) Troubleshoot as needed, track problems, constraints and responses.

Deliverable – Critical review of process, improvements as needed.

g) O/M on installed facilities (~ by users).

Deliverable – Properly functioning facility.

Task 5- Monitor project to ensure effectiveness, consistency with program goal and regulatory requirements.

a) Monitor the installation to evaluate effectiveness of program and projects.

Deliverable – Evaluation of program and project effectiveness.

b). Prepare a brief status report annually to include projects completed, projects underway, project monitoring, troubleshooting outcomes and priorities for following year.

Deliverable – Progress reports.

Objective 4: Provide Opportunities to Improve Habitat

including water quality, water reliability and stream habitat in project areas for landowners with identified barrier removal and screening needs. Landowner participation is entirely voluntary.

Task 1- Provide outreach and educational opportunities to participating landowners relative to improving water quality, water reliability and stream habitat.

a) Conduct outreach efforts such as press release, public meetings, providing speakers to grower groups, existing newsletters and other landowner venues.

Deliverable – Outreach materials (brochure, press release, newsletter articles), speakers, meetings, media coverage.

b) For specific tributaries, conduct in-person outreach and education and offer on-site reviews and consultations about options best suited to individual operation.

Deliverable – Individual consultations, as requested.

Task 2- Provide technical assistance specific to individual landowner needs regarding improvement of water quality, water reliability and stream habitat.

a) For interested individuals, provide technical assistance to create a plan to implement improvements, such as NRCS farm plan, mapping, data gathering ideas (soil moisture, other), piping, irrigation methods, etc.

Deliverable – Farm plans, farm maps, additional acres using best management practices. Utilize funding sources such as the Irrigation Efficiency Program and the Environmental Quality Incentives Program to supplement available Salmon monies.

b) Provide follow-up communication to determine interest level to proceed to Task 3.

Deliverable – Estimated numbers of individuals and potential costs for additional on-farm improvements.

Task 3- Provide financial assistance for individual landowner needs regarding improvement of water quality, water reliability and stream habitat. The financial assistance program under this task will be implemented in cooperation with BPA and only after prior agreement has been reached with BPA regarding the terms and conditions for any financial assistance payments charged to this contract

a) For interested individuals, assist with gaining financial assistance to implement on-farm improvements determined to be appropriate and feasible in Task 2, above. Grower shall have flexibility in selecting from a menu of options.

Deliverable – Irrigation improvements, water quality and habitat improvements, additional acres using best management practices.

b) Provide follow-up communication to determine progress on implementation. This will assist grower as well as be used for reporting and monitoring purposes.

Deliverable – Progress report on habitat improvement projects.

Objective 4: Evaluation

Task 1- Develop and implement a monitoring and evaluation program that will document the effectiveness of habitat and flow enhancements funded under this contract. The results of the monitoring and evaluation will be reported annually in both the annual project report and the special FCRPS Biological Opinion report (see objective 5).

Objective 5: Reporting

Task 1- Quarterly reports will be submitted to the BPA project manager addressing significant issues regarding project implementation – issues, problems, delays, successes.

Task 2- Annual reports will be required consistent with the terms as conditions of this contract. A draft of the annual report is due the BPA project manager 60 days prior to the end of the current performance period.

Task 3- A special annual report will be required for the FCRPS Biological Opinion Annual Report. The format, schedule and additional details for this report will be provided by BPA's project manager as soon as they are finalized.

For interested individuals, assist with gaining financial assistance to implement on-farm improvements determined to appropriate and feasible in Task 2, above. Grower shall have flexibility in selecting from a menu of options.

Deliverable – Irrigation improvements, water quality and habitat improvements, additional acres using best management practices.

b) Provide follow-up communication to determine progress on implementation. This will assist grower as well as be used for reporting and monitoring purposes.

Deliverable – Progress report on habitat improvement projects.

Objective 5: Reporting

Task 1- Quarterly reports will be submitted to the BPA project manager addressing significant issues regarding project implementation – issues, problems, delays, successes.

Task 2- Annual reports will be required consistent with the terms as conditions of this contract. A draft of the annual report is due the BPA project manager 60 days prior to the end of the current performance period.

Task 3- A special annual report will be required for the FCRPS Biological Opinion Annual Report. The format, schedule and additional details for this report will be provided by BPA's project manager as soon as they are finalized.

Reference for Objective 3, Tasks 1 & 2:

Washington Department of Fish and Wildlife. August 2000. *Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual*. Environmental Restoration Division, Habitat Program, Salmonid Screening, Habitat Enhancement and Restoration (SSHEAR) Section.

Cowiche Creek Watershed Screening and Barrier Assessment (draft)

Yakima Tributary Access and Habitat Program

Submitted by:

David Nunn
North Yakima Conservation District

October 2003

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Introduction

Cowiche Creek is identified as potentially providing significant production potential for Summer Steelhead and Coho. Rearing for Spring Chinook is also viable in the lower reaches. During the spring/summer of 2003 the North Yakima Conservation District in conjunction with the Yakima Tributary Access and Habitat Program (YTAHP) inventoried the Cowiche Drainage area identifying barriers, screening needs, and habitat conditions from the mouth to the upper most extent of fish utilization. Surveys did not extend beyond a natural fish migration barrier as defined in the *Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual* (WDFW 2000). For the basis of this report, sites reference the location of a fish barrier or safety concern, and features consist of the individual structures. This report summarizes the results of the inventory and provides the field documentation for further action through a technical/advisory tributary team.

General Watershed Description

Located in Central Washington near Yakima, the Cowiche drainage basin is 116 mi² and a tributary to the Naches River at RM 2.7. Land ownership is predominately private with several contiguous blocks of State and Federal lands. The watershed divides into two sub drainages, the North Fork Cowiche Creek and the South Fork Cowiche Creek. The South Fork Cowiche Creek is perennial throughout with a secondary drainage, Reynolds Creek, contributing in the upper reaches. The North Fork Cowiche Creek is highly regulated with an irrigation reservoir located approximate six miles from the confluence of the south fork.

Cowiche Creek and SF Cowiche Creek

The lower end of the watershed resides in shrub-steppe ecology with a historic cottonwood/willow riparian community that has been highly converted through irrigated agriculture and residential development. This ecology carries through beyond the confluence of the north fork (RM 7.47) until it transitions into a hardwood oak forest ecotype. Present irrigated agriculture impacts and development become minimal at this point, and land use transforms into open grazing and WDFW lands. Past the wildlife lands, the watershed transforms into a mixed forest of pine and fir with land ownership checkered between private, Boise Cascade timberlands, and DNR parcels. Timber harvest management, grazing, and small-developed parcels have impacted the riparian corridor in places throughout this segment, but much of the riparian area is in a functioning condition, albeit reduced in historic capacity. The upper watershed, including Rock Creek, is dominated by fir species with timber harvest and grazing as the only impacts in localized areas.

Reynolds Creek

Reynolds Creek is major tributary to the South Fork Cowiche Creek at RM 20.70. The ecology is dominated by a mixed pine and fir forest type until the upper reaches when it transforms into a fir dominated system. The land use is a checker of large parcels owned by private, Boise Cascade timberlands, and State DNR lands. Grazing, roads, and timber harvest impact portions of this drainage in varying degrees. Overall, this drainage is functioning and recovering from past impacts.

NF Cowiche Creek

The North Fork Cowiche Creek resides in shrub-steppe ecology with more of an intermittent stream type historically. Land use consists of irrigated orchards and hay interspersed with residential development. The amount of perennial water available during the year on the stream is limited to operational spills, springs, and agricultural return flows. A large portion of the stream goes dry in mid to late summer. Above the reservoir in French Canyon, the stream enters a dry oak ecology mixed with pines higher up. There are some spring inputs, but this segment is ephemeral and dry by early summer. Overall, the functionality of the North Fork Cowiche Creek is reduced and severely impaired in certain sections.

Methods

Inventory

The stream inventory started at the mouth of Cowiche Creek, walking the entire watershed where anadromous fish use may occur or have the potential to exist. All man-made features (culverts, diversions, dams, and fishways) encountered were evaluated to the potential of being migration barriers or a safety issue for fish. All fish bearing tributaries to Cowiche Creek were also walked and evaluated until the point of a natural migration barrier. The potential for fish presence was determined by stream size, gradient, fish observation, and flow regime. Species presence or potential were determined from direct observation and by using resources such as current WDFW fish distribution maps (WDFW 2003).

Data collection and evaluation of features follow the methodologies outlined in the *Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual* (WDFW 2000). Measured instream habitat samples included substrate class, habitat type, habitat quantity, and the quality of stream habitat. Field inventory also documented habitat, significant stream features, and man-made features all referenced with a hip chain. Riparian functionality was also qualified using the methods for lotic areas in BLM technical reference TR 1737-15 (Pricard 1998).

Barrier and Screening Priority Indexes

The Fish Passage Priority Index (PI) model combines the variables (species utilization, passage improvement, production potential, habitat gain, project cost, and fish stock mobility and health) to arrive at a numeric methodology of feasibility and project ranking. The Screening Priority Index (SPI) model combines the variables relevant to water diversions, (species utilization, pumping rates, production potential, project cost, and fish stock mobility and health) to arrive at a numeric indicator of relative priority. The PI and SPI values are not comparable; the PI indicates production potential, and the SPI indicates potential mortality from unscreened or inadequately screened diversions.

The PI and SPI values are intended as a guide towards prioritizing barrier/screening projects. Other factors need to be considered such as the likelihood of restoring anadromous fish populations. The expected species utilization assumes correction of all downstream human-made barriers preventing anadromous fish access. Production values predicted for the PI assume

all upstream human-made barriers are corrected. The PI and SPI are dynamic, in that the model allows for modification as new information becomes available.

Reach Breaks

Reach breaks were originally split based on passage barriers and significant changes in stream habitat (substrate, slope, habitat type, tributary input, or habitat quality) as prescribed in the *Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual* (WDFW 2000). These reach breaks were later refined to assist in the current watershed description and direction for future restoration opportunities.

Results

Cowiche Creek including SF, Reynolds, and Rock Creek

On these waterways, 72 features were evaluated and logged. Of these 72 features, 13 are partial or full barriers to fish passage (Table 1). Of the 13 barrier features, six are dams, six are other structures such as rock dams, and one is a culvert. All barriers had the required threshold of 200 meters of habitat gain. If fixed (excluding the gain from the North Fork), the total potential habitat gain would be 39.65 linear miles, or 165,065 square meters of spawning habitat and 150,148 square meters of rearing habitat.

A total of 48 diversions were identified (Table 2); 39 pump diversions and 9 gravity diversions. Of these diversions, one pump was screened in accordance to WDFW standards. Many of the sites had trash screens, but mesh size and screen area did not meet criteria. Of the 39 pump sites, it is evident that 14 of these may not have an adjudicated water right. It was unclear at the time of inventory if these were inactive sites, or active. Screening Indexes were only calculated for adjudicated water rights found in the *Report of Referee for Subbasin No. 18*. Should further information come forth in a final order, Screening Indexes can be calculated based on the adjudicated right.

Reaches for the **Reynolds Creek** (Figure 4) were delineated as follows:

- **Reach 1** - Confluence of SF Cowiche Creek to start of logging units at RM 2.65. Broke due to land use implications.
- **Reach 2** - Start of logging unit to RM 6.35 where slope changes significantly.
- **Reach 3** - Start of slope break to waterfall at RM 8.07.
- **SF Reynolds Reach 1** - Confluence to Reynolds Creek to 4ft cascade which above appeared to be non fish bearing in summer season.

Reaches for the **Rock Creek** (Figure 4) were delineated as follows:

- **Reach 1** – Confluence of SF Cowiche Creek to natural waterfall at RM .28

Reaches for the **Cowiche Creek and SF Cowiche Creek** (Figures 1-4) were delineated as follows:

- **Reach 1** – Confluence with Naches River to .5 mile past Prospect Way Rd at RIP ranch access – RM 2.15. Broke due to functionality and land use.

- *Reach 2* – RIP ranch access to last house past Cowiche Canyon Rd – RM 3.30. Broke due to improved functionality and higher productivity potential.
- *Reach 3* – Cowiche Canyon Proper- RM 5.80. Broke due to land use and functional stability.
- *Reach 4* – Outside conservancy land to Summitview bridge- RM 8.45. Broke due to reduced creek functionality and downward trend.
- *Reach 5* – Summitview bridge to Evans Pond – RM 9.3. Broke due to increase in functionality.
- *Reach 6* – Evans Pond to lower diversion on Snow Mountain Ranches – RM 11.09. Broke due to increased functionality and productivity potential.
- *Reach 7* - Lower end of snow mountain ranches to Pellicer bridge – RM 12.66. Broke due to decrease in functionality and trend.
- *Reach 8* - Pellicer bridge to .5mile past WDFW land boundary – RM 14.40. Broke due to increase in functionality and productivity potential.
- *Reach 9* - Past WDFW boundary to blue gate bridge in sliver parcels – RM 25.80. Broke due to slope change and stream type.
- *Reach 10* - Blue gate in sliver parcels to natural barrier above confluence of Rock Creek. – RM 30.96.

NF Cowiche Creek

On the north fork, 29 features were evaluated and logged. Of these 29 features, 12 are partial to full barriers to fish passage (Table 1). Of the 12 barrier features, three are culverts, four are dams, one is a gravity diversion, and three other are either concrete features or man-made rock dams. Because the creek currently experiences intermittent regulated flows, habitat gains for this segment were assumed that the creek could provide some benefit to fish habitat during the year at a future date. This condition should be considered when prioritizing barrier/screening projects in this section. With this assumption, all barriers would have the required 200 meters of habitat gain. If fixed, the total potential habitat gain would be 5.88 linear miles, or 10,644 square meters of spawning habitat and 11,495 square meters of rearing habitat.

A total of 16 diversions were identified (Table 2); 14 pump diversions and two gravity diversions. All legal diversions are in need of proper screening. Of the 16 diversions, it is evident that eight of these may not have an adjudicated water right. At the time of inventory, it was not clear to whether these sites were inactive or active. Screening Indexes were only calculated for adjudicated water rights found in the *Report of Referee for Subbasin No. 18*. Should further information come forth in a final order, Screening Indexes can be calculated based on the adjudicated right.

Reaches for the **NF Cowiche Creek** (Figure 2) were delineated as follows:

- *Reach 1* – Confluence of Cowiche Creek to natural tree dam structure at RM 1.09. Broke due to change in substrate and instream habitat characteristics.
- *Reach 2* – Tree dam structure to culvert at RM 2.28. Broke due to reduction in fines and instream habitat characteristics.
- *Reach 3* – Culvert at RM 2.28 to large culvert on Summitview – Cowiche Rd at RM 3.04. Broke due to chronic lack of summer flows.
- *Reach 4* – Large culvert on Summitview – Cowiche Rd to old BOR structure by Tieton. End of survey.

Table 1. Passage barriers requiring repair within Cowiche drainage with Priority Index (PI).

Site ID	Stream	Tributary to	Stream Mile	Expected Species Utilization*	Feature Type	% Pass-able	Habitat Gain			Additional Barriers		Priority Index (PI)
							Length (m)	Spawning (m²)	Rearing (m²)	Up-stream	Down-stream	
Cowiche Creek Watershed – surveyed 2003												
NYCD1	Cowiche Cr	Naches R	.01	CO/CK/SH/RT/DB	Fishway	67	73,275	175,709	161,643	25	0	31.34
NYCD2	Cowiche Cr	Naches R	.6	CO/CK/SH/RT/DB	Other	67	72,273	170,577	155,617	24	1	41.99
NYCD4	Cowiche Cr	Naches R	.8	CO/CK/SH/RT/DB	Dam	67	71,932	169,028	154,107	23	2	36.57
NYCD19	Cowiche Cr	Naches R	2.6	CO/CK/SH/RT/DB	Other	67	68,903	162,732	145,589	22	3	40.83
NYCD28	Cowiche Cr	Naches R	7.45	CO/CK/SH/RT/DB	Dam	33	51,833	135,345	114,119	21	4	33.65
NYCD49	NF Cowiche Cr	Cowiche Cr	.7	CO/SH/RT	Dam	33	8,348	8,759	10,278	13	5	15.47
NYCD50	NF Cowiche Cr	Cowiche Cr	.9	CO/SH/RT	Other	67	8,348 ⁽¹⁾	8,759 ⁽¹⁾	10,278 ⁽¹⁾	12	6	13.26
NYCD51	NF Cowiche Cr	Cowiche Cr	1.78	CO/SH/RT	Culvert	67	6,596	6,262	6,741	8	10	10.26
NYCD53	NF Cowiche Cr	Cowiche Cr	1.14	CO/SH/RT	Dam	67	7,618	6,637	8,255	11	7	12.07
NYCD54	NF Cowiche Cr	Cowiche Cr	1.28	CO/SH/RT	Other	67	7,618 ⁽²⁾	6,637 ⁽²⁾	8,255 ⁽²⁾	10	8	10.91
NYCD55	NF Cowiche Cr	Cowiche Cr	1.62	CO/SH/RT	Dam	67	6,840	6,262	6,879	9	9	11.43
NYCD61	NF Cowiche Cr	Cowiche Cr	2.28	CO/SH/RT	Culvert	67	5,781	5,305	6,057	7	11	9.92
NYCD62	NF Cowiche Cr	Cowiche Cr	2.37	CO/SH/RT	Dam	33	5,647	5,162	5,862	6	12	12.69
NYCD64	NF Cowiche Cr	Cowiche Cr	3.04	CO/SH/RT	Culvert	67	4,564	3,850	4,046	5	13	8.58
NYCD65	NF Cowiche Cr	Cowiche Cr	3.46	CO/SH/RT	Other	0	3,879	2,691	3,434	4	14	11.61
NYCD66	NF Cowiche Cr	Cowiche Cr	4.13	RT	Dam	33	2,807	1,786	2,384	3	15	4.43
NYCD67	NF Cowiche Cr	Cowiche Cr	4.14	RT	Dam	0	2,807 ⁽³⁾	1,786 ⁽³⁾	2,384 ⁽³⁾	2	16	4.43
NYCD69	NF Cowiche Cr	Cowiche Cr	5.87	RT	Other	0	2,807 ⁽⁴⁾	1,786 ⁽⁴⁾	2,384 ⁽⁴⁾	1	17	3.72
NYCD70	NF Cowiche Cr	Cowiche Cr	5.88	RT	Dam	0	2,807 ⁽⁴⁾	1,786 ⁽⁴⁾	2,384 ⁽⁴⁾	0 ⁽⁵⁾	18	3.72
NYCD32	SF Cowiche Cr	Cowiche Cr	8.6	CO/SH/RT/DB	Dam	33	49,954	129,649	110,062	5	5	30.43
NYCD78	SF Cowiche Cr	Cowiche Cr	9.3	CO/SH/RT/DB	Other	33	48,329	127,319	108,012	4	6	29.34
NYCD43	SF Cowiche Cr	Cowiche Cr	11.1	CO/SH/RT/DB	Dam	33	45,503	119,540	104,434	3	7	27.97
NYCD44	SF Cowiche Cr	Cowiche Cr	11.8	CO/SH/RT/DB	Dam	33	44,377	115,384	101,992	2	8	28.89
NYCD71	SF Cowiche Cr	Cowiche Cr	12.6	CO/SH/RT/DB	Dam	0	42,958	108,196	97,452	1	9	31.33
NYCD77	Rock Creek	SF Cowiche Cr	.07	RT/DB	Culvert	67	342	287	171	0	10	2.15

* Species Codes: CK – Chinook, CO – Coho, SH – Steelhead, RT – Resident trout, DB– Bull Trout

⁽¹⁾ Used habitat gains based on NYCD49 to get habitat gain.

⁽²⁾ Used habitat gains based on NYCD53 to get habitat gain.

⁽³⁾ Used habitat gains based on NYCD66 to get habitat gain and PI.

⁽⁴⁾ Used habitat gains based on NYCD66 to get habitat gain.

⁽⁵⁾ A reservoir exists 2 miles upstream; survey stopped at NYCD70, goes dry above in summer.

Table 2. Water diversions requiring repair in the Cowiche drainage.

Site ID	Stream	Tributary to	Ownership Type	Diversion Type	Associated Dam	Flow (gpm)	Screening Priority Index
Cowiche Creek – surveyed 2003							
NYCD4	Cowiche Cr	Naches R	Private	Gravity diversion	Yes	605.9	11.98
NYCD5	Cowiche Cr	Naches R	Private	Pump diversion	No	31.4	6.32
NYCD7	Cowiche Cr	Naches R	Private	Pump diversion	No	44.8	6.91
NYCD10	Cowiche Cr	Naches R	Private	Pump diversion	No	24.7	5.96
NYCD12	Cowiche Cr	Naches R	Private	Pump diversion	No	58.4	7.39
NYCD14	Cowiche Cr	Naches R	Private	Pump diversion	No	26.9	6.08
NYCD15	Cowiche Cr	Naches R	Private	Pump diversion	No	13.7	5.14
NYCD16	Cowiche Cr	Naches R	Private	Pump diversion	No	143.6	9.25
NYCD19	Cowiche Cr	Naches R	Private	Pump diversion	Yes	35.9	6.54
NYCD20	Cowiche Cr	Naches R	Private	Pump diversion	No	44.9	6.92
NYCD23	Cowiche Cr	Naches R	Private	Pump diversion	No	35.9	6.54
NYCD24	Cowiche Cr	Naches R	Private	Pump diversion	No	376.9	11.77
NYCD25	Cowiche Cr	Naches R	Private	Pump diversion	No	89.8	8.22
NYCD26	Cowiche Cr	Naches R	Private	Pump diversion	No	85.3	8.12
NYCD28	Cowiche Cr	Naches R	Private	Pump/gravity div	Yes	305.2	11.17
NYCD30	SF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	44.9	5.2
NYCD32	SF Cowiche Cr	Cowiche Cr	Private	Gravity diversion	Yes	1366.6	11.04
NYCD34	SF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	4.5	2.93
NYCD35	SF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	17.95	4.14
NYCD37	SF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	62.8	5.66
NYCD39	SF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	53.9	5.44
NYCD42	SF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	152.6	7.06
NYCD43	SF Cowiche Cr	Cowiche Cr	Private	Gravity diversion	Yes	390.5	8.07
NYCD44	SF Cowiche Cr	Cowiche Cr	Private	Gravity diversion	Yes	1122	10.51
NYCD45	SF Cowiche Cr	Cowiche Cr	Private	Gravity diversion	No	1158	10.59
NYCD47	NF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	41.8	4.39
NYCD48	NF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	26.9	3.93
NYCD49	NF Cowiche Cr	Cowiche Cr	Private	Gravity diversion	Yes	41.8	3.97
NYCD54	NF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	80.8	5.18
NYCD57	NF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	26.9	3.93
NYCD58	NF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	132	5.86
NYCD60	NF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	44.9	4.47
NYCD63	NF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	143.6	5.98
NYCD72	SF Cowiche Cr	Cowiche Cr	Private	Gravity diversion	No	206.5	7.62
NYCD73	SF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	4.5	2.93
NYCD79	Cowiche Cr	Naches R	Private	Pump diversion	No	71.8	7.78
NYCD80	SF Cowiche Cr	Cowiche Cr	Private	Gravity diversion	No	134.6	6.18
NYCD81	NF Cowiche Cr	Cowiche Cr	Private	Pump diversion	No	41.8	4.39

Figure 1. Cowiche Creek, reaches 1-4.

Figure 2. SF Cowiche Creek, reaches 4-7. NF Cowiche, reaches 1-4.

Figure 3. SF Cowiche Creek, reaches 7-9.

Figure 4. SF Cowiche Creek, reaches 9-10. Reynolds and Rock Creek.

Discussion

Of the fish bearing waters surveyed, all have potential for anadromous fish use providing fixing passage barriers and sustaining biological flows. The riparian quality is functional to highly functional in Reynolds Creek and the upper reaches of South Fork Cowiche Creek. Lower isolated reaches on the south fork and mainstem of Cowiche Creek also exhibit a high degree of functionality. Much of the watershed however is degraded and remains at a lesser functional state or in a state of continued degradation. The North Fork Cowiche Creek also contains several segments that are functional, but overall is showing signs of trending degradation and nonfunctionality.

Degradation has occurred over time in the watershed resulting in incised channels and reduced riparian capacity. Land use and flood/bank protection measures continue to maintain this lower functional state throughout some of the lower reaches in the watershed especially in the developed areas. Areas that have a larger riparian corridor for stream maintenance and floodplain building have maintained functionality and have the capacity to recover. Vegetation management plays a crucial role in the health of the stream in Cowiche and is evident between healthy reaches and sections of active degradation.

On the mainstem of Cowiche Creek, including the south fork, low head irrigation dams constitute the majority of the passage barriers in the stream. These dams are associated with gravity diversions throughout the lower and mid reaches of the stream. At certain times of the year, these diversions greatly reduce the amount of aquatic habitat in the stream directly below them. Man-made rock/tarp structures are also common on pump diversions in this system, which present barriers to fish during the irrigation season. Instream flow is also a problem in the lower reaches of Cowiche Creek during late summer months. There is a fishway at the mouth of the creek, which causes a partial barrier due to operation.

In the upper watershed, a seventeen-foot waterfall precludes all upstream migration on the South Fork Cowiche Creek. Rock Creek also has an impassable waterfall shortly past the barrier culvert with the confluence of the south fork. Old culverts on Reynolds Creek have all been removed, and there are no man made barriers left requiring fixing.

The North Fork of Cowiche Creek is highly regulated with a reservoir located in the upper reaches. There are numerous abandoned irrigation diversions acting as dam barriers on this stream. There is only one legal gravity diversion remaining which is merely a man-made rock check dam. Man-made check structure associated with pump diversions are not uncommon on this stream either. During the summer months, the stream is completely dewatered except at the lower reaches. Throughout the reaches surveyed, there were also several natural partial barriers to fish passage such as debris jams and headcuts.

Water diversions throughout the entire watershed require updated screens to comply with fish safety. Illegal water withdrawal is also an issue in the watershed that needs addressed. The following descriptions detail the fish passage barriers, water diversions and physical habitat of each reach surveyed. Refer to *Table 1* and *Table 2* for feature information and priority indices and pages 9-12 for maps showing locations.

Cowiche Creek and SF Cowiche Creek

Reach 1 - *Confluence with Naches River to .5 mile past Prospect Way Rd at RIP ranch access (RM 2.15).*

This reach is entrenched and confined with armored banks. It contains irrigated orchards and the highest amount of development in the watershed. The historic floodplain is developed except for a few isolated areas and at the mouth. An old railroad bed remains in the historic floodplain and acts as a dike throughout most of this reach past Powerhouse Road. Livestock have been fenced out of this reach and the channel has a good canopy where it has not been altered by homeowners. Unstable beaver dams were noted, especially where idle parcels remain. Riparian habitat is highly impacted, with sections barely having ten foot per side. Overall, this reach is stable, functioning at a much lower level with notable signs of impacts from human development. The stream gradient is 1% with a pool/riffle ratio of 38:60. The substrate is dominated by gravels, and had a 12% embedment.

Three barriers exist in this reach. Also identified were eleven pump diversions, some with rock check structures (see Photo 4 for example). Six need updated screens, and four pump sites could not be referenced to a valid water right.

The first site, **NYCD1**, at the mouth is the City of Yakima's irrigation diversion and associated fish ladder. This diversion is a partial barrier to adults and likely a full barrier to juvenile fish due to operation and design.

Photo 1. Site NYCD1

Photo 2. Site NYCD2, Powerhouse Rd in background.

NYCD2 is an undershot irrigation canal that becomes a barrier at low flows. With a PI of 41.99, this site has the highest PI of any barrier in the watershed. There is another structure associated with this feature upstream before the bridge, which is not a barrier.

The third barrier in this reach is a gravity diversion, **NYCD4**. This site has a low head dam causing a partial passage barrier for juveniles and adults during low flows. The current screen mesh is also a fish safety issue.

Reach 2 - RIP ranch access (RM 2.15) to last house past Cowiche Canyon Rd (RM 3.30).

This reach is less channelized and confined within its banks, and has reestablished a new floodplain with more beaver activity and less human bank alteration. The riparian width is (50-75ft per side), and the reach provides more of a functionally stable system. It contains irrigated orchards and a lesser amount of residential development impacts than reach one, but still suffers from unnecessary riparian vegetation removal in places. There is potential for livestock access in the upper end of this reach, but no apparent problems were noted. The historic floodplain is not as heavily developed as reach one, but still contains the old railroad bed that acts as a dike. The average stream gradient is 1.5% with a pool/riffle ratio of 53:47. The substrate is dominated by gravels, and had a 18% embededness.

This reach contains six pump diversions requiring fixing, one of which has a barrier manmade check dam, see Photo 4. Three of these pump sites could not be referenced to a valid water right.

Photo 3. Site NYCD4, looking downstream.

Photo 4. Site NYCD19, illustrating a man-made checkstructure.

Reach 3 – Cowiche Canyon Conservancy section.

This reach is managed by the Cowiche Canyon Conservancy and is used for recreation and preservation. The riparian condition is functional with riparian widths varying between 100 – 150ft per side, but this reach overall is limited due to the existing railroad bed that remains throughout and the narrow historic floodplain. An increase in boulder habitat and rapids were found in this reach from natural colluvium and constrictions from the rail bed. The average stream gradient is 1-2% with a pool/riffle ratio of 51:38 and 8% of habitat being classified as rapid. The substrate is dominated by gravels, and had a 25% embededness.

No barriers or man made features were found in this reach. This reach does have the possibility for debris jams under the old railroad bridges during certain flood events.

Reach 4 – End of Conservancy land to Summitview bridge (RM 8.45).

This reach resides in a wide valley bottom dominated by irrigated hay and pasture. Development pressures are minimal, but evidence of bank armoring and suppressing natural channel migration have persisted over the years. Riparian widths are diminished in this

reach (0 – 20ft per side) from land management practices. The overall accessibility to livestock was high (70-100%), but some attempts had been made to fence certain sections with promising results. During late summer, this reach also suffers from low flows from gravity feed irrigation withdrawals. Overall, the functionality of this reach is nonfunctional to functional at risk with signs of a downward trend. Although its current condition is not stellar, this reach has good potential for recovery. The average stream gradient is 1% with a pool/riffle ratio of 31:56 and 12% of habitat being classified as rapid. The substrate is equally dominated by gravels and cobbles, and had a 3% embedment.

This reach also contains nine pump diversions and several near stream infiltration galleries. Two of the pump sites could not be referenced to a valid water right.

NYCD28 (Photo 5) is an irrigation diversion dam with a gravity diversion, it is a passage barrier for all fish during the irrigation season when the check boards are in place. This site also diminishes instream flows directly below, until flows pick up again at the head of the canyon. A new screen is needed to prevent juveniles from entrainment. Efforts are in place to fix this barrier and improve instream flow.

Photo 5. Site NYCD28

Photo 6. Site NYCD32

Reach 5 – Summitview bridge to Evans Pond (RM 9.3).

This small reach is above the tributary input of the North Fork Cowiche Creek. A significant increase in channelization and entrenchment can be seen in this reach. Apple orchards dominate this reach for land use, and there is high degree of meander restriction from bank armoring and entrenchment. Several headcuts were noted in this reach and areas of significant lateral cutting. A majority of this reach is in a nonfunctional state, and where it is somewhat functional it appears to be trending downward. Riparian width is approximately 10-15ft per side. The stream gradient is 1-1.5% with a pool/riffle ratio of 22:78. The substrate is dominated by gravels, and had a 3% embedment.

This reach contains two barriers. **NYCD 32** (Photo 6) is an active gravity diversion that is a partial barrier to adults and a full barrier to juveniles. A new screen is also needed to prevent juvenile entrainment. **NYCD78** (Photo 7) is another barrier for fish migration consisting of a boulder check dam. This structure appears to be in conjunction with the large irrigation pond, possibly acting as a infiltration gallery.

Photo 7. Site NYCD78

Photo 8. Site NYCD43

Reach 6 – Evans Pond (RM 9.3) to Snow Mountain Ranches (RM 11.09).

This reach continues through apple orchard into a concentration of residential development before entering into large land tracts. Channel health improves and the riparian system becomes more functional in the lower half of this reach. The upper half suffers from degradation and recent flood damage, and is in a nonfunctional state trending downward. The major contributing cause is likely grazing management. The channel is incised, but sinuosity has developed within the current floodplain, and in spots has access to the historic floodplain. Streamside vegetation management has played a critical roll in maintaining sustainability in this section. Riparian width varies in this reach from 0-20ft per side. An increase in redd activity was noted in this reach. The average stream gradient is 1.5% with a pool/riffle ratio of 35:43 and 22% of habitat being classified as rapid. The substrate is equally dominated by gravel and cobbles, and had a 4% embeddedness.

This reach contains one barrier. **NYCD 44** (Photo 8) is an inactive gravity diversion that is a partial barrier to adults and a full barrier to juveniles if it is rebuilt. It appears that this site has legal water rights associated with it. No screen was being used at this site.

Eight pump diversions are associated with this reach. Two of these diversion sites could not be referenced to a valid water right. There may also be an infiltration gallery or fixture associated with the Yakima/Tieton Irrigation District along the creek as indicated on the map, see Figure 2.

Reach 7– Snow Mountain Ranches (RM 11.09) to Pellicer bridge (RM 12.66).

This reach is in good condition and shows the most functionality of all previous reaches. The riparian condition is healthy, and is 25-100 ft wide throughout. Channel incisement is not as severe as in previous reaches while sinuosity has established in the new floodplain and there are signs of channel widening in places. Beaver activity was noted pushing water onto the historic floodplain and developing more complex channel features. Large wood is accumulating in the channel and the riparian area provides an adequate source of recruitment. Redd sitings were also in the highest concentration than previous reaches. The average stream gradient is 2% with a pool/riffle ratio of 35:46 and 18% of habitat being classified as rapid. The substrate is dominated by gravels, and a had a 13% embeddedness.

This reach contains two active gravity diversions and one inactive gravity diversion. There was also noted one pump diversion with a rock check dam which is not referenced as having a water right. **NYCD44** is the first gravity diversion, and is a barrier to juveniles and adults during certain flows, see Photo 9. This low head dam structure has two outlets, but only the right bank is functional. This barrier also dewateres the stream for a short segment during low water years, and does not have a screen.

Photo 9. Site NYCD44

Photo 10. Site NYCD45

NYCD45 (Photo 10) is the second active gravity diversion that currently is not a barrier, but does need a screen. There is concrete material in the creek, but it has been notched and buried by sediment over the years. Future operational changes may make this structure a barrier requiring fixing for fish passage.

NYCD71 (Photo 11) is a nonactive gravity diversion, but is the last man made barrier to upstream migration. It is a complete juvenile barrier and significant adult barrier. The structure also constricts the channel and is actively causing bank failure on the left. YTAHP has allocated funding for removal of this in 2004.

Photo 11. Site NYCD71

Photo 12. Site NYCD72

Reach 8 - Pellicer bridge (RM 12.66) to .5mile past WDFW land boundary (RM 14.40).

This reach is a section of lower functional state that is significantly entrenched lacking the sinuosity seen in the prior section. There are active sections of lateral bank erosion. Part of this section suffered a riparian vegetation loss due a fire in the Oak Creek Wildlife Area in the summer of 2002. Based on the erosion seen and riparian condition it appears this reach is not in stable condition and will likely continue to degrade until stability is reached. Grazing has been excluded from this area for some years, but may have been highly used in the past. The average stream gradient is 2.5% with a pool/riffle ratio of 26:67 and 7% of habitat being classified as rapid. The substrate is dominated by cobbles, and had a 10% embededness.

This reach contains one gravity diversion and one small pump diversion. Site **NYCD72** (Photo 12) is currently screened with a temporary screen and will be replaced in 2004. The pump site, **NYCD73**, requires an updated screen.

Reach 9 – WDFW boundary (RM 14.40) to blue gate in sliver parcels (RM 25.80).

This reach is comprised of State Wildlife land and large tracts of private land with smaller private parcels interspaced. Towards the end of this reach there are some Boise Cascade lands and more private sliver parcels. The beginning of the reach resides in an oak forest type and transitions into a mixed pine/fir forest. The historic floodplain is in good shape with riparian widths between 25 – 150ft per side. Beaver dams and complexes were frequently found on this reach in active/stable and unstable states. Several large pools were noted associated with wood jams or beaver activity in this reach. There was a notable amount of large woody debris found within the channel and throughout the floodplain (Photo 13).

This reach contains some highly functional areas combined with sections which are functional but in a recovery state. The channel is slightly entrenched in places, but still suffers from some entrenchment throughout especially towards the upper end of this reach. Several redd sites were noted in this reach associated with pool tail outs. A significant portion of the riparian is accessible to grazing and is used as such. Reduced shrub components are evident in portions and some bank degradation was noted, but it currently was not being grazed that heavily. Certain parcels have animal confined close to the stream which has caused significant bank erosion in spots. Side channels were more evident in this reach and were usually associated with beaver activity (Photo 14). The average stream gradient is 2.0% with a pool/riffle ratio of 20:70 and 9% of habitat being classified as rapid. The substrate is equally dominated by cobbles and gravels, and had a 12% embededness.

This reach contains one legal gravity diversion which had not been developed, and could barely be located. There are also three pump diversions that could not be referenced to a legal water right.

Photo 13. Channel with large wood availability.

Photo 14. Side channel associated with beaver activity.

Reach 10 – *Blue gate in sliver parcels (RM 25.80) to natural barrier above the confluence of Rock Creek (RM 30.96).*

This reach is comprised of State DNR land, Boise Cascade land, and small slivers of private land. This reach transitions into a more narrow valley type and begins to change gradient type. The historic floodplain is forested with mixed pine/fir and is predominately entrenched throughout. Beaver dams are less frequent in this reach being replaced more by debris jams. Large wood has been incorporated into the channel forming small cascades and pools. There are several debris jams and smaller cascades that may constitute a migration barrier for some species. The natural barrier was found 1.1 miles past the confluence of Rock Creek and is a 17ft waterfall (Photo 16). The riparian area is accessible to grazing, but is not heavily used.

Photo 15. Bridge in need of repair.

Photo 16. 17ft waterfall on South Fork Cowiche.

Commercial logging activities are prevalent in this reach. Some riparian areas had been logged completely in the past 50 years, with more recent timber sales leaving small buffers and selective cutting around the riparian area. Overall this reach is functioning, but there are areas that exist at

a lower functional state due to past land management and incisement. The average stream gradient is 4.5% with a pool/riffle ratio of 18:36 and 45% of the habitat being classified as rapids. The substrate is dominated by cobbles, and had a 14% embededness.

There are no man made barriers or diversions in this reach. One bridge will fail eventually because of channel aggradation, but it is currently not a barrier (Photo 15).

Rock Creek

Reach 1 – *Confluence with SF Cowiche Creek to barrier waterfall (RM .28).*

Rock Creek is a small tributary to the SF Cowiche Creek at RM 29.78 that is a higher gradient than the mainstem of SF Cowiche Creek. A barrier culvert, **NYCD77**, was found at where the Road to Dome Peak cross the creek (Photo 17). The barrier is based on the slope of the culvert. The stream itself is in good functioning condition with noticeable wood incorporated in the system. Grazing impacts seem to be minimal primarily due to topography and dense canopy coverage. A 17ft waterfall exists .28 miles past the confluence which is a complete barrier to fish passage (Photo 18).

Shortly past the culvert there is a small side tributary that flows 1100ft before coming to a 13ft waterfall barrier. The small tributary has been logged and suffers from grazing impacts, mainly sedimentation along the streamside where the cattle seem to congregate. It was questionable if any fish habitat existed in this stretch so it was not surveyed, but the upstream barrier was documented. The average stream gradient for the main channel is 8% with a pool/riffle ratio of 14:49, and 37% of the habitat being classified as rapids. The substrate is equally dominated by cobbles and gravels, and had a 14% embededness.

Photo 17. Site NYCD77, culvert on Rock Creek.

Photo 18. Barrier waterfall on Rock Creek.

Reynolds Creek and SF Reynolds

Reach 1 – *Confluence with SF Cowiche Creek to start of logging units (RM 2.65).*

This low gradient reach resides in a single private landowner holding. The channel is functional and looks to be improving with building a floodplain and the establishment of beaver throughout. Several active beaver dam complexes were noted during the survey. The vegetation is a mixed forest type of hardwoods and conifers transitioning into a conifer dominated system towards the end of the reach. The riparian condition is in good condition with adequate room for channel migration and is complex in composition and age structure. This system also supports various wetland communities in the floodplain from springs and/or proximity of groundwater in the floodplain. The average stream gradient for the main channel is 2% with a pool/riffle ratio of 33:67. The substrate is dominated by cobbles, and had a 14% embededness.

There are no man-made barriers or water withdrawals in this reach. One headcut may pose a migration barrier to small fish at certain times of the year. The dirt access road that runs next to the stream causes some impacts from creek encroachment in places. Some sections of the road have been rerouted out of the floodplain alleviating the maintenance required in the active floodplain. Logging impacts have been minimal in this section, and it is still actively being grazed. The present grazing pressures are not appearing to be causing detriment to the floodplain, but there are some historic degradation may have been contributed by overuse from grazing.

Reach 2 - *Start of logging unit (RM 2.65) to where stream gradient class changes (RM 6.35).*

The landownership changes to Boise Cascade timberland with a portion of State DNR land towards the end of the reach. The beginning of the reach maintains a similar gradient and geomorphic character as reach one, but has suffered from riparian logging and is recovering from past harvest practices. After a mile, the condition of riparian habitat and stream channel condition improve from a change in logging practices to some highly functioning habitat. Riparian widths were noted as 250ft per side in this section. Beaver activity was less pronounced than the previous reach and became nonexistent towards the end of the reach. Lots of wood was noted in the channel and available on the floodplain and the density of riparian shrubs was very high, see Photo 19. The average stream gradient for the main channel is 2.5% with a pool/riffle ratio of 18:81. The substrate is dominated by cobbles, and had a 17% embededness.

There are no man-made barriers or water withdrawals in this reach. Several large culverts were removed at an old decommissioned road crossing. An old roadbed remains along the north side of the creek, but has been rerouted and blocked from vehicle traffic. Jeeps and ATVs still have accessed this old road in unauthorized places. Some natural barriers such as debris dams may restrict natural migration during certain flows in this reach.

Reach 3 – Gradient change (RM6.35) to barrier waterfall (RM 8.07).

Land ownership continues to be sections of Boise Cascade land and terminating in State DNR sections. This reach is dominated by a fir forest type and overall is in a good functioning condition. Some areas have had little riparian disturbance and are very healthy. Early into the reach, jeep trails and historic road placement compromise the functionality of the stream. Signs of entrenchment and bank erosion are evident as well in the early section of this reach. Several small tributaries dump into this stretch enhancing the riparian diversity and providing nice forested wetland types in places.

At RM 7.95, the creek splits into two branches with equal flow between. The south fork was surveyed for 678 feet carrying an average gradient of 12%. Numerous hydraulic jumps between natural cascades, four feet with a one foot plunge pool as an example, were encountered in a narrow debris choked canyon. After sampling one site and encountering the 4 foot cascade, it was determined that upstream fish migration was unlikely. The other fork continued 400ft before hitting a 3ft cascade, and went 200 ft more before a 12ft high cascade was determined as the natural migration barrier (Photo 20). The average stream gradient for the main channel is 5% with a pool/riffle ratio of 11:56 and 32% of the habitat being classified as rapid. The substrate is dominated by gravels, and had a 15% embededness.

There are no man-made barriers or withdrawals in this reach. The failed attempts of road closures and unauthorized riparian access pose a potential threat to the health of this reach in the lower sections.

Photo 19. Typical riparian condition for Reach 2.

Photo 20. Cascade example downstream of natural barrier on Reach 3.

NF Cowiche Creek

Reach 1 – Confluence of Cowiche Creek to a natural tree dam feature (RM 1.09).

This reach for the most part remains perennial for most of the year from springs and minimal irrigation return flows. The channel is highly entrenched with little floodplain development. The riparian vegetation varies from fair to poor with an average width of less than 20ft per side.

In some places there is no riparian zone other than what exists in the channel. Overall this reach is in a lower functional stable state that is trending down based on bank stability and flow regime. Approximately 30% of the stream is assessable to livestock. The average stream gradient for the main channel is 1.5% with a pool/riffle ratio of 51:38 and 11% of the habitat being classified as rapid. The substrate is dominated by gravels, and had a 37% embedment. This reach has a small canyon towards the end where it has some larger bed material and rapid features. One redd site was noted below the canyon in a pool tail out.

This reach contains four pump diversion sites, one of which is not referenced as having a water right. Of the three legal diversions, new updated screens are required on all sites. In the canyon one gravity diversion (NYCD49) is also located. This diversion was classified as a barrier based on the rock/tarp construction during the irrigation season. Above the canyon, there is also a rock dam (NYCD50) that is a barrier during certain flows, especially if tarps were placed behind the rocks for further water impoundment, see Photo 21. Below NYCD50 is a washed out culvert that has been left in the channel. Currently it is positioned to not affect passage, but could form a debris jam causing flood hazard or fish passage problem. One natural 5ft boulder cascade located at the canyon mouth may prevent certain species passage as well in this reach during low flows. A natural live debris jam with a 4ft drop is located at the end of this reach and this may be a barrier for certain species at lower flows, see Photo 22.

Photo 21. NYCD50 rock dam barrier.

Photo 22. Natural tree dam barrier.

Reach 2 – Natural tree dam feature (RM 1.09) to culvert at RM 2.28.

This reach for the most part remains perennial for most of the year from springs and minimal irrigation return flows. The channel is entrenched and has some lower functional habitat in the lower reach, but quickly degrades to a nonfunctional system from stream conditions and land use practices. The riparian vegetation is limited and lacks a diverse composition of native plants for maintenance and recovery especially in the upper portion of the reach. The trend of this reach appears to be going down based on active headcuts and severe bank erosion in places. Livestock have 60% access to banks throughout the reach, being especially prevalent in the upper portions. The geology of this reach appears to consist of deep layers of fine sediments, which are very susceptible to downcutting when the riparian area is stressed. The average stream gradient for the main channel is 1% with a pool/riffle ratio of 61:38. The substrate is dominated by fine

material, and had a 74% embededness. Several active beaver dams were observed in this reach, one of which is stable.

This reach contains eight pump sites with four unable to be referenced to a valid water right. One diversion (**NYCD54**) with a valid right has a tarp barrier during irrigation season that acts as a man-made check dam, and is a barrier for fish passage. Two small diversion dams act as fish barriers, especially during low flow and for juvenile passage. **NYCD55** is an inactive site and has no irrigation associated with it. There is one culvert (**NYCD51**) on Livengood road that is a partial barrier based on slope. Besides having man-made barriers this reach has several headcuts ranging from 2.5ft to 6ft, which likely cause passage issues at various flow stages, see Photo 23.

Photo 23. Headcut with 6ft cascade debris jam.

Photo 24. Site NYCD62

Reach 3 – Culvert at RM 2.28 to culvert on Summitview-Cowiche road (RM 3.04).

This reach is intermittent in flows depending on amounts released from the regulation reservoir in French Canyon. Some sections are augmented in late summer from the return flow from the Cowiche treatment plant effluent and agriculture return flows. The channel is entrenched, but not as severe as the previous reach, and has some degree of floodplain development in the incised channel. The riparian vegetation improves with widths between 15- 40 per side, and has a more diverse age class and composition. Streambanks are vegetated with riparian shrubs capable of maintaining bank integrity, however there are still some parcels that have problems with vegetation degradation and removal. About 20% of the stream has access to livestock, and Japanese Knotweed was noted invading the floodplain in sections. The geology also changes from fine sediments to being comprised of alluvium and coarse materials. This reach may have the most functionality other than intermittent flows during the late summer. The average stream gradient for the main channel is 1% with a pool/riffle ratio of 44:55. The substrate is equally dominated by fine material and gravels, and had a 40% embededness.

This reach contains a partial barrier culvert (**NYCD61**) at the beginning based on the slope. Site **NYCD62** has a pump diversion and a gravity diversion. The gravity diversion has a dam feature that has a barrier apron for fish passage, see photo 24. Water rights did not appear to be issued to this site, so these diversions may be inactive. The second pump diversion, **NYCD63**, needs an

updated screen and may pose a passage problem if flow regimes were changed on the NF Cowiche due to a tarp check structure that may be used in association with the pump.

Reach 4 - *Culvert on Summitview-Cowiche road (RM 3.04) to old BOR diversion dam near Tieton (RM 5.88).*

This reach has flows in the spring and when water is released from the reservoir in French Canyon, otherwise it is dry during late summer. Small springs in this reach may provide localized moisture, but are not enough to supplement seasonal flows. Aside from lacking water, this reach continues to provide some functionality in a developing floodplain in the entrenched channel with improved riparian conditions similar to the previous reach. About 15% of the streamside is accessible to grazing, and the vegetation is diverse with good composition where present. In the functioning portion of this reach, vegetation widths were recorded up to 60ft in places, but overall widths were more around 15ft per side. Closer to the old BOR diversion the reach becomes nonfunctional due to scour and entrenchment. Several parcels continue to degrade existing riparian vegetation through removal or poor grazing practices, and this exacerbates instability. Some beaver activity was noted in this reach. The average stream gradient for the main channel is 1% with a pool/riffle ratio of 37:62. The substrate is dominated by gravels, and had a 24% embededness.

This reach starts with a large culvert going under the county road. The culvert (**NYCD64**) is a partial barrier due to velocity in a level B assessment. Past the culvert, there is the remnants of an old slab dam (**NYCD65**) that has fallen into the channel that is a complete barrier to fish passage, see Photo 25. There is no water withdrawal site associated with this feature. Shortly above the concrete slab, a 2ft debris dam also impairs fish migration. At RM 4.13, there are two sites (**NYCD66** and **NYCD67**) that have fish barrier dam structures.

Photo 25. Site NYCD65

Photo 26. Site NYCD69 and NYCD70

NYCD66 is a low head dam with an apron that prevents fish passage, and **NYCD67** has a 1.5ft drop that would prevent passage. An old gravity diversion (**NYCD68**) is also located in this vicinity, but appears to be no longer in service. It did not have a screen, and was full of sediment at time of inspection.

The final barrier is site **NYCD69** and **NYCD70**, see Photo 26. These sites are somewhat related, but both act as individual barriers. **NYCD69** is an old cemented channel bed that has a large

scour hole beneath it preventing fish passage. It may have been done in order to protect the old diversion dam (**NYCD70**), which appears to no longer be in service. **NYCD70** is a complete passage barrier. The survey was ended at this point, but the stream channel goes approximately two miles further to the base of French Canyon reservoir above where it continues as an ephemeral system. Until water management changes in this section, there is no viable fish habitat above this site for resident trout or anadromous species. No questionable diversionary sites were encountered during the survey in this reach.

Recommendations

The South Fork Cowiche provides some abundant spawning and rearing opportunities for anadromous fish if barriers and flows could be resolved. This includes access into the Reynolds Creek watershed. The North Fork Cowiche has limited fish capabilities due to current flow regimes and the amount of fine sediment found in the channel.

Stream stability is another area of concern for this watershed, especially in areas of degraded riparian vegetation and reduced channel sinuosity from bank armoring. This was very evident during the spring 2003 flood where poorly vegetated banks suffered severe cutting and reinforced banks continued to degrade. The cycle appears to have been an ongoing progression for this watershed over many years, and continues today. Land use choices and riparian management have made the difference between healthy reaches and unhealthy ones.

Riparian projects will have the largest impact in reaches that have a strong indication of recovery and are not in a lower functional state, such as a highly entrenched armored channel. There are reaches where reconnecting the historic floodplain may benefit and protection from future floodplain development. An initial look at the SF Cowiche Creek points to the beginning of Reach 4 and the end of Reach 6 as good candidates for riparian type projects. Reach 9 may provide an opportunity for floodplain reconnected because of State land ownership and active beavers in the adjacent reach.

Initial PI and SPI values are an attempt to quantify barrier and screening projects for this watershed. Several of the identified barriers on the mainstem of Cowiche (**NYCD28**, **NYCD32**, and **NYCD72**) have been prioritized and funded for passage through Salmon Recovery Funding Board monies and early action YTAHP monies. Future barrier/habitat projects will come from the recommendations of the Cowiche Creek Tributary Team and be funded through YTAHP or other sources.

Besides barrier and screening projects, there is a need for landowner education about riparian stewardship to prevent further degradation, improve streamside habitat, and minimize flood damage. Improving animal access to critical reaches and providing a means for animal stock watering are also key areas for select reaches in the watershed. A continued watershed effort will be required to implement such projects and keep the cultural integrity of the watershed. As part of the habitat portion of YTAHP, NYCD is committed to assisting in the restoration and sponsoring projects that improve the quality and quantity of streamside habitat.

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Appendix A

All features catalogued on the Cowiche survey. Features sorted by stream and approximate location along the watercourse. RR=repair required, OK=feature not a barrier or safety issue.

Stream	Tributary to	Site Id	Lat	Long	Feature	Repair Status	Fish use	Owner type
Cowiche	Naches	NYCD1	46.6279286	120.568597	dam/fishway	RR	yes	City
		NYCD2	46.6273022	120.580734	other	RR	yes	City
		NYCD3	46.6272403	120.580955	other	OK	yes	City
		NYCD4	46.6249517	120.583856	dam/gravity	RR	yes	Private
		NYCD5	46.622074	120.585838	pump	RR	yes	Private
		NYCD6	46.6212711	120.586011	pump	OK	yes	Private
		NYCD7	46.6203755	120.58575	pump	RR	yes	Private
		NYCD8	46.6200841	120.586036	pump	RR	yes	Private
		NYCD9	46.6199408	120.586703	pump	RR	yes	Private
		NYCD10	46.6190018	120.588611	pump	RR	yes	Private
		NYCD11	46.6180165	120.59153	pump	RR	yes	Private
		NYCD12	46.6189617	120.595787	pump	RR	yes	Private
		NYCD13	46.6189688	120.596566	pump	RR	yes	Private
		NYCD14	46.6191283	120.599016	pump	RR	yes	Private
		NYCD15	46.6191615	120.599303	pump	RR	yes	Private
		NYCD16	46.6198396	120.602698	pump	RR	yes	Private
		NYCD17	46.6201779	120.607353	pump	RR	yes	Private
		NYCD18	46.6202062	120.607975	pump	RR	yes	Private
		NYCD19	46.6220678	120.612296	pump/other	RR	yes	Private
		NYCD20	46.6214287	120.615336	pump/other	RR	yes	Private
		NYCD21	46.6218685	120.622715	pump	RR	yes	Private
		NYCD22	46.6314103	120.66468	pump	RR	yes	Private
		NYCD23	46.6343587	120.666574	pump	RR	yes	Private
		NYCD24	46.6356607	120.666774	pump	RR	yes	Private
		NYCD25	46.6372019	120.667158	pump	RR	yes	Private
		NYCD26	46.6378828	120.66839	pump	RR	yes	Private
		NYCD79	46.6394331	120.671128	pump	RR	yes	Private
		NYCD27	46.6441809	120.67736	pump	RR	yes	Private
		NYCD28	46.6472191	120.682134	dam/gravity	RR	yes	Private
SF Cowiche	Cowiche	NYCD29	46.6471051	120.68456	other	OK	yes	Private
		NYCD30	46.6475078	120.686016	pump	RR	yes	Private
		NYCD31	46.6471253	120.690955	other	OK	yes	Private
		NYCD32	46.6481681	120.704459	dam/gravity	RR	yes	Private
		NYCD78	46.6513476	120.716157	other	RR	yes	Private
		NYCD33	46.6514624	120.716294	other	OK	yes	Private
		NYCD34	46.6538692	120.720141	pump	RR	yes	Private
		NYCD35	46.6543201	120.720878	pump	RR	yes	Private
		NYCD36	46.654336	120.720944	other	OK	yes	Private
		NYCD37	46.6542226	120.72176	pump	RR	yes	Private
		NYCD38	46.6541647	120.722841	pump	RR	yes	Private
		NYCD39	46.6545293	120.72459	pump	RR	yes	Private
		NYCD40	46.654321	120.725641	pump	RR	yes	Private
		NYCD41	46.654038	120.729181	pump	RR	yes	Private
		NYCD42	46.6552228	120.733647	pump	RR	yes	Private
		NYCD43	46.6554072	120.746727	gravity/other	RR	yes	Private
		NYCD82	46.657184	120.753681	pump/other	RR	yes	Private
		NYCD44	46.6581814	120.758723	dam/gravity	RR	yes	Private
SF Cowiche	Cowiche	NYCD45	46.6605895	120.763296	gravity	RR	yes	Private
		NYCD46	46.6482161	120.682671	pump	RR	yes	Private

NF Cowiche		NYCD47	46.6506916	120.685105	pump	RR	yes	Private	
		NYCD81	46.649173	120.683959	pump	RR	yes	Private	
		NYCD48	46.6516334	120.686752	pump	RR	yes	Private	
		NYCD49	46.6522832	120.690268	gravity	RR	yes	Private	
		NYCD50	46.6538901	120.691871	other	RR	yes	Private	
		NYCD51	46.6635139	120.69706	culvert	RR	yes	County	
		NYCD52	46.6566075	120.691636	pump	RR	yes	Private	
		NYCD53	46.6566075	120.691636	dam/pump	RR	yes	Private	
		NYCD54	46.6583627	120.692907	other/pump	RR	yes	Private	
		NYCD55	46.6620987	120.695119	dam	RR	yes	Private	
		NYCD56	46.6625594	120.695945	pump	RR	yes	Private	
		NYCD57	46.6628898	120.69695	pump	RR	yes	Private	
		NYCD58	46.664259	120.697178	pump	RR	yes	Private	
		NYCD59	46.6676533	120.699147	pump	RR	yes	Private	
		NYCD60	46.6683823	120.699156	pump	RR	yes	Private	
		NYCD61	46.669965	120.699778	culvert	RR	yes	Private	
		NYCD62	46.6710364	120.700347	dam/pump	RR	yes	Private	
		NYCD63	46.6763787	120.710114	pump	RR	yes	Private	
		NYCD64	46.6763787	120.710114	culvert	RR	yes	County	
		NYCD65	46.6792768	120.716026	other	RR	yes	Private	
		NYCD66	46.6847262	120.726159	dam	RR	yes	Private	
		NYCD67	46.6848031	120.72625	dam	RR	yes	Private	
		NYCD68	46.6849295	120.726325	gravity	OK	yes	Private	
		NYCD69	46.7034395	120.745605	other	RR	unk	Private	
		NYCD70	46.7035338	120.745634	dam	RR	unk	Private	
		SF Cowiche	NYCD71	46.6615102	120.774019	dam/gravity	RR	yes	Private
			NYCD72	46.6611253	120.779777	gravity	RR	yes	Private/ WDFW
			NYCD73	46.6619975	120.784838	pump	RR	yes	Private
			NYCD74	46.653729	120.844027	pump	RR	yes	Private
			NYCD75	46.6187355	120.883612	pump	RR	yes	Private
NYCD80	46.6082007		120.910442	gravity	RR	yes	Private		
NYCD76	46.5898871		120.95369	pump	RR	yes	Private		
Rock Creek	SF Cowiche	NYCD77	46.5859748	121.025216	culvert	RR	yes	WDNR	

Yakima Tributary Access & Habitat Program—FY 2003

Cooke Creek – EWC Canal Siphon

Kittitas County, Washington

The Cooke Creek – Ellensburg Water Company Canal Project removed a creek-canal intersection, screened a creek water diversion and restored the creek bed elevation to re-establish fish passage. The project is located in Kittitas County, Washington, approximately 5 miles east of Ellensburg.

This Yakima Tributary Access and Habitat Program (YTAHP) project was sponsored by the Ellensburg Water Company (EWC), a private company providing irrigation water to more than 10,000 acres. MWH provided engineering support and MRM Construction of Ellensburg was the construction contractor. The project totaled approximately \$360,000 with YTAHP funding the major portion and a portion of costs covered by the EWC. The EWC now owns and operates the facilities and are responsible for ongoing maintenance.

The project included running the EWC canal through an inverted siphon under the creek bed, installing an automated, screened diversion for up to 17 cubic feet of water, placing a concrete dam and fishway across the creek to allow for water diversion and fish passage at the diversion, and installation of several rock weirs to reestablish a more normal creek bed elevation to provide for fish passage.

The project was permitted during 2002, and constructed from January to March, 2003. The facility was operational for the 2003 irrigation season. Project photographs are provided on the following pages.

Key project participants:

Larry Browne, Ellensburg Water Company Superintendent, 509-925-5498

Carol Ready, Kittitas County Water Purveyors, 509-929-7323

Dana Postlewait, PE, MWH managing engineer, 425-556-1288

Don Montgomery, PE, MWH Constructors, 303-439-2800.

Dave Foreman, MRM Construction, 509-925-6000

Dave Myra, SCW Resource Conservation & Development Council, 509-248-4963

David Byrnes, BPA Contract Officer's Technical Representative, 503-230-3171

Cooke Creek Siphon

Habitat Enhancement Project

Ellensburg Water Company Canal Inverted Siphon at Cooke Creek
near Ellensburg in coordination with the

Yakima Tributary Access & Habitat Program

With funding through

Northwest Power Planning Council and Bonneville Power Administration

Temporary rerouting of Cooke Creek around construction site.

Pre-construction survey stakes in canal (left) and berm to hold back standing winter canal waters.

Excavation of siphon site and installation of three sections of siphon pipe.

**Siphon inlet construction — pipe backfilled,
concreted and trash rack.**

Recreated stream bed
over siphon.

This project effectively
separates stream and
canal waters, provides
passage and screens
the diversion.

Rock weirs installed to correct stream gradient and allow for fish to easily move up and down stream.

Looking up Cooke Creek
from the siphon site
toward diversion site near
trees.

**EWC's diversion from Cooke Creek is equipped with a self-cleaning fish screen and a fishway (ladder).
Creek runs left to right in upper picture.**

With assistance from
MWH Engineers, Inc.
MRM Construction, Inc.
Completed
Spring 2003

Yakima Tributary Access Habitat Program

Tributary Team Elements

Purpose To coordinate and facilitate implementation of diversion screening, fish passage and habitat enhancement projects that support landowners and protect natural resources.

Tributary teams will be initiated when all or majority of a given stream has been surveyed; membership will include stakeholders (adjacent landowners, YTAHP, regulatory agencies, and other pertinent parties); and will kick off with an invitation to a local educational meeting regarding YTAHP. The kick-off meeting will include a presentation of YTAHP goal and objectives, stream status in basin, overview of regulatory landscape, including listings, state law regarding diversion screening, other related watershed efforts and include a question and answer period.

I. Stakeholders

Parties with interest in project implementation or outcomes, potentially to include:

- YTAHP representative(s)

- RC&D

- Adjacent Landowners

- Water Users

- Irrigation Entity, if any

- Regulatory and Resource Interests

 - WDFW

 - Ecology

 - YN

 - Environmental ?

- City or County representatives

- Dept of Transportation

- "Non-stakeholder" - Engineering support, as needed for technical decisions

II. Schedule

1. Stream Survey information compiled, truthed, and mapped.
2. Invitations to adjacent parcel owners, water users, agency reps and others.
3. Kickoff meeting and presentation, begin/continue dialog.
4. Follow-up meetings, tours, site visits, engineering input.
5. Compile potential project list, evaluation matrix, work toward project selection.
6. Nuts and bolts re funding/cost share, permits, easements, timelines, etc.
7. Standardize to increase efficiency; Individualize for flexibility.
 - Standardize engineering short list, bidding processes, easements, etc.
 - Individualize solutions to meet needs and support objectives.

III. Project Selection

- Stream survey, maps, landowners, water right and other information

- Project evaluation matrix

- Standard evaluation criteria

- Customize evaluation/selection process as needed per stream

Review of EDT data?
Work with Core Team on final selection, funding, permits

IV. Funding

YTAHP BPA Budget
YTAHP Additional Request
SRFB - Salmon Recovery Funding Board
FRIMA – Fisheries Restoration and Mitigation Act

V. Permitting

Follow permitting flow chart
Conduct programmatic permitting/environmental review as possible in advance.
Include regulatory staff as possible I process or offer meetings/presentations to
increase awareness and answer questions.

Cultural Review: plan to conduct. List of local certified archaeologists

VI. Procurement / Disbursements

When does YTAHP or member procure, vs. engineer or contractor

VII. Engineering

Prequalified list
Conservation District Engineers
Bidding / Advertisements
Selection
Engineering contracts and agreements
Bonding, responsibilities, accountability

VIII. Construction

Bidding
Selection
Construction contracts and agreements
Bonding, responsibilities, accountability

IIIX. Outreach

Media
Other Agencies
Public
Regulatory
Funding Sources

IX. Troubleshooting

Program challenges, concerns, and possible solutions

Table 1. Yakima Tributary Access and Habitat Program Organizational Teams

Team	Membership^{1, 2}		Responsibilities
Administration	RC&D		Grant administration, accounting, invoice preparation, coordinating with Program Manager on budget tracking and project updates for grantor(s)
Program Management	RC&D WDFW KCWP KCCD NYCD AID (BOR)		Program organization and schedules, assigning tasks and tracking progress, program consistency, forming partnerships, updating the strategic plan, producing applications for funding, finding and organizing technical support, producing the program annual plans, producing the tributary plan outline that states the basic requirements of each tributary plan, determining when to refer items to the PAT, review of tributary plans, and other functions as necessary.
Permits and Approvals	WDFW KCWP KCCD NYCD AID (BOR)	NMFS USFWS COE Ecology (BOR)	Preparation of environmental documents, (site visits for environmental evaluation purposes, managing public review?, This team may assist in obtaining funds to implement the overall program.
Engineering and Technical Support	WDFW KCWP KCCD NYCD AID Eng	NMFS USFWS COE Ecology (BOR) (YN)	The technical workgroup will perform the engineering design work and provide technical assistance on screens and barriers, including materials and contract specifications. Maintenance of GIS information and data base.
Tributary	KCCD NYCD KCWP AID Local Stakeholders Individual Irrigation Entities Trained Interns Other affected parties	NRCS (YN)	The tributary teams will perform the bulk of the project planning, local outreach and implementation work, and maintenance of data bases and maps. Trib Teams may manage surveys. The tributary teams will also be responsible for most of the habitat enhancement work, including on-farm water use efficiency and riparian modifications. The NRCS may assist in these efforts also.

¹ The core team includes the RC&D, WDFW, KCWP, KCCD, NYCD, AID and may include the BOR as resources allow. Consulting engineers, CD engineers or other engineers will perform engineering, procurement and other services under the direction of the core team.

² Entities not included in the core team, but will be integral to the success of the program include the NMFS, USFWD, YN, COE Ecology, NRCS and others.

A list of acronyms can be found in the introductory pages.

Yakima Tributary Access and Habitat Program

Project Evaluation Criteria

[illegible]

Notes:

1. Listed species present? Yes = 4, No = 1. Non-listed species of interest? Yes = 2.
2. Habitat gained: > 2 miles = 4; 1 to 2 miles = 3; 0.5 to 1 mile = 2; < 0.5 miles = 1.
3. Quality of gained habitat: Excellent = 4; Good = 3; Fair = 2; Marginal = 1.
4. Benefit:
5. Planning: Complete = 4; Final draft = 3; Preliminary = 2; None = 1.
6. Design: Complete = 4; 50% design = 3; Preliminary = 2; None = 1.
7. Permit: Issued = 4; Final draft = 3; Preliminary = 2; None = 1.
9. Funding: BPA or Other, confirmed = 4; Offered List = 3; Possible = 2; None = 1.