
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Lower Klickitat River Riparian & In-Channel Habitat Enhancement Project

BPA project number: 9705600

Contract renewal date (mm/yyyy): 01/2000 **Multiple actions?**

Business name of agency, institution or organization requesting funding

Yakama Indian Nation - Fisheries

Business acronym (if appropriate) YIN

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses

7.6A, 7.6A2, 7.6B.3, 7.6B.6, 7.6D, 7.7, 7.8E.2

FWS/NMFS Biological Opinion Number(s) which this project addresses

Other planning document references

Wy Kan Ush Me Wa Kush Wit, Klickitat Subbasin Plan, CRFMP, Standard Methodology for Conducting Watershed Analysis, Washington State Salmon and Steelhead Stock Inventory (SASSI, 1992).

Short description

Watershed assessment, improve riparian conditions for steelhead and coho with cattle exclosure fencing, land aquisitions, LWD addition, enhance pool formation, capture spawning gravels, revegetation of riparian areas, augment summer flows, reduce sediment.

Target species

Winter and summer steelhead (steelhead), coho and resident salmonids

Section 2. Sorting and evaluation

Subbasin

Klickitat River: Focusing on the following lower basin tributaries: Little Klickitat River, Swale, Dillacort, Snyder, Wheeler Canyon, Summit, White, Trout Creeks

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
<input checked="" type="checkbox"/> Anadromous fish <input type="checkbox"/> Resident fish <input type="checkbox"/> Wildlife	<input type="checkbox"/> Multi-year (milestone-based evaluation) <input checked="" type="checkbox"/> Watershed project evaluation	<input checked="" type="checkbox"/> Watershed councils/model watersheds <input type="checkbox"/> Information dissemination <input type="checkbox"/> Operation & maintenance <input checked="" type="checkbox"/> New construction <input checked="" type="checkbox"/> Research & monitoring <input checked="" type="checkbox"/> Implementation & management <input type="checkbox"/> Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9506325	YKFP M&E/Klickitat - TFW habitat inventory, salmonid population assesment	Data collection through project #9506325 is being used to more effectively direct watershed project in the lower Klickitat basin.
9603501	Satus Watershed Restoration	Information sharing of project success and short-comings.
9803300	Restore Upper Toppenish Creek Watershed	Information sharing of project success and short-comings.
9705300	Toppenish-Simcoe Instream Flow Restoration and Assessment	Information sharing of project success and short-comings.
9206200	Yakama Nation Riparian/Wetlands Restoration	Information sharing of project success and short-comings.
9705100	Yakima Basin Side Channel	Information sharing of project success and short-comings. Land appraisal and aquisition information will relate directly to Project objectives.
9901300	Ahtanum Creek Watershed Assessment	Information sharing of project success and short-comings.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1997	August 97 - Project Initiation, gathered community support through local meetings,	

1997	Construct two Sediment Retention Ponds	
1997	Installed eight miles of riparian fence. TFW Habitat survey of Swale Creek.	
1997	Conducted six miles of Timber Fish and Wildlife (TFW) Habitat survey of Swale Creek.	
1998	Completion of Biological Opinion for five additional ponds and in-channel construction. Obtained permits for all construction work.	
1998	Construction of five sediment ponds, on intermittent tributaries of Swale Creek, which deliver sediment laden waters directly to Swale Creek.	
1998	Installed off-channel watering system, which will allow for the elimination of high density sheep wintering operation within intermittent tributary of Swale Creek.	
1998	Installed seven miles of riparian fence.	
1998	Revegetation of all Sediment retention Ponds and within portions of riparian enclosures.	

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Level I Watershed Assessment of lower Klickitat subbasin project tributaries	a	Gather knowledgeable professionals and local landowners to form watershed assessment team.
		b	Gather and analyze all existing pertinent information
		c	Investigate all cost-sharing opportunities.
		d	Develop and prioritize prescriptions for each lower basin tributary enhancement opportunity. Formulate monitoring plan for each prescription.
2	Increase survival and production of salmonids in tributary streams of the lower Klickitat through livestock management.	a	Exclusion or management of livestock grazing
		b	Development of off-channel livestock watering systems
		c	Plant riparian vegetation within exclusion fencing to reestablish riparian corridor.
		d	Work with local rancher to develop grazing practices to minimize impacts to riparian corridor.
3	Increase survival and production of salmonids in tributary streams of the lower Klickitat through control of fine sediment delivery and improve water quality.	a	Construct sediment retention ponds in key drainages to reduce impacts from fine sediments from agricultural practices.
		b	Riparian revegetation along stream corridor

			to increase stream shading and lower stream temperatures.
4	Increase survival and production of salmonids in tributary streams of the lower Klickitat through attenuation of the hydrograph.	a	Construct retention ponds to create wet meadow habitat to retain runoff and reduce the peak of the hydrograph.
5	Increase survival and production of salmonids in tributary streams of the lower Klickitat through acquisition of key habitat.	a	Identify and pursue purchase of key habitat from willing landowners
		b	Development of conservation easements with willing landowners.
6	Increase survival and production of salmonids in tributary streams of the lower Klickitat through construction of in-channel habitat structures.	a	Construct in-channel structures to expedite adult upstream migration into favorable spawning and rearing habitats.
		b	In suitable areas incorporate large woody debris into the stream channel.
7	Monitor habitat improvements	a	Conduct standardized habitat inventory methodology at routine intervals to monitor changes to channel (TFW Ambient Monitoring)
		b	Conduct standardized salmonid population monitoring at routine intervals to monitor changes over time (snorkel transects).
		c	Conduct point-step vegetation inventory within randomly selected riparian exclosures.
		d	Conduct photo point monitor sites to document riparian regrowth within exclosures

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	8/1997	5/1998			0.00%
2	9/1997	12/2010			28.00%
3	10/1997	12/2010			10.00%
4	10/1997	12/2010			10.00%
5	3/1999	12/2010			25.00%
6	6/1999	12/2010			24.00%
7	5/1998	12/2015			3.00%
				Total	100.00%

Schedule constraints

Potential constraints include permitting and weather.

Completion date

2010, with M&E to continue for several more years

Section 5. Budget

FY99 project budget (BPA obligated): \$295,683

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	1/3 Bookkeeper. YIN Biologist, WDFW, and NRCS cost-shared personnel	%2	7,000
Fringe benefits	15.3 %	%0	1,071
Supplies, materials, non-expendable property	Fencing supplies, tools, rooted stock, and in-channel structures.	%10	30,000
Operations & maintenance	Materials for TFW habitat monitoring.	%1	2,500
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Land acquisition, off-channel livestock watering system development.	%27	80,000
NEPA costs	incurred by BPA	%0	0
Construction-related support	none anticipated	%0	0
PIT tags	# of tags: none	%0	0
Travel	none	%0	0
Indirect costs	23.6%	%9	28,456
Subcontractor	Northwest Service Academy (NWSA) - project labor.	%18	55,325
Subcontractor	Local Contractors - In-channel structures.	%22	65,324
Subcontractor	Local Contractors - Sediment Retention Ponds.	%10	30,324
Other		%0	0
TOTAL BPA FY2000 BUDGET REQUEST			\$300,000

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount (\$)
NRCS	Sediment Retention Pond design. Riparian fencing design. 1/8 time personnel	%2	5,000
WDFW	Fencing crew supervisor, assistant project planner. 1/4 time personnel.	%3	11,000
WDFW	Design and construction supervision of In-channel work (WDFW engineer).	%1	3,000
NRCS, WDFW, Local Landowners	Participation in tributary watershed assessment, to identify project opportunities	%2	5,000
		%0	
Total project cost (including BPA portion)			\$324,000

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	\$300,000	\$260,000	\$230,000	\$200,000

Section 6. References

Watershed?	Reference
<input checked="" type="checkbox"/>	Washington Forest Practices Board, Standard Methology for Conducting Watershed Analysis, Under Chapter 222-22 WAC, Version 3.0 November 1995
<input type="checkbox"/>	Beschta, R.L. 1991. Stream Habitat Management for Fish in the Northwestern United States: The Role of Riparian Vegetation. <i>American Fisheries Society Symposium</i> 10:53-58.
<input type="checkbox"/>	Binns, A.N. 1994. Long-Term Responses of Trout and Macrohabitats to Habitat Management in a Wyoming Headwater Stream. <i>North American Journal of Fisheries management</i> 14:87-98.
<input type="checkbox"/>	House, R. 1996. An Evaluation of Stream Restoration Structures in a Coastal Oregon Stream, 1981-1993. <i>North American Journal of Fisheries Management</i> 16:272-281
<input type="checkbox"/>	Evans, R.A., and R.M. Love. 1957. The step point method of sampling-a practical tool in range research. <i>J. Range Manage.</i> 10:208-212.
<input type="checkbox"/>	Fast, D.E et al. 1989. Yakima/Klickitat Natural Production and Enhancement Program. Prepared for Bonneville Power Administration. Project No. 88-120 Grant DE-A179-88BP93203.
<input type="checkbox"/>	Timber Fish Wildlife Ambient Monitoring Protocol. 1994. Northwest Indian Fisheries Commission. TFW-AM9-94-0011994.

PART II - NARRATIVE

Section 7. Abstract

Conduct Watershed Assessment to identify and prioritize habitat restoration opportunities in tributaries of the Lower Klickitat Basin. Continue ongoing restoration and monitoring activities with Swale and Little Klickitat subbasins. Through continuation of ongoing and initiation of new restoration efforts, it is expected that critical habitat for salmonid production will be increased and can be demonstrated. Through monitoring, the project can be assessed for its ability to meet target objectives for riparian conditions and in-channel habitat, as well as judge effects on production of salmonids. This knowledge can be applied to future projects for determining expected outcomes and benefits to habitat enhancement. The objective of the project is to improve spawning, rearing and holding habitat, stabilize stream banks and channels, revegetate riparian corridors with beneficial deciduous and coniferous species, deter grazing impacts, and provide adequate summer flows for fish passage and rearing. The project work is also expected to improve water quality by reducing erosion, filtrating and storing fine sediments, augmenting canopy cover for temperature moderation and reducing livestock waste from entering waters. Through restoration efforts on the channel, available habitat is anticipated to increase by at least two-three fold for spawning, juvenile rearing, velocity refugia, and adult holding. The Lower Klickitat River Riparian and In-Channel Habitat Enhancement Project (Project) ties specifically to 1994 Columbia Basin Fish & Wildlife Program (CBFWP) goals of an ecosystem approach to species recovery through protection and improvement to habitat conditions. This coordinated approach brings together land managers and landowners to develop a habitat plan to protect an important natural resource.

These improvements will benefit both anadromous (steelhead, chinook and coho salmon) and resident (rainbow trout) salmonid populations in the Klickitat River. Project duration is from present through September 2010. Timber Fish & Wildlife (TFW) Ambient Habitat Monitoring, photo documentation, step-point vegetation surveys, and fish populations surveys pre and post project work will quantify whether objectives were attained.

Section 8. Project description

a. Technical and/or scientific background

Tributaries within the lower reaches of the Klickitat watershed provide critical spawning habitat for winter and summer steelhead (steelhead) and coho, as well as, critical rearing habitat for all juvenile salmonids. The Klickitat steelhead population has suffered serious decline from historical levels along with all mid-Columbia ESU steelhead. This trend is unlikely to reverse itself soon without increasing smolt production. Through watershed assessment and subsequent habitat enhancement activities, it is expected that in-basin conditions, which currently limit production, can be ameliorated.

The project area lies directly south (downriver) of the “Closed Area” of the Yakama Nation. It is within this lower reach of the Klickitat subbasin that anthropomorphic influences are most evident. From the late 1800’s this portion of the basin has experienced extensive livestock grazing, agricultural impacts, timber harvest, channel constriction from railroad embankments, and moderate levels of human habitation.

This project will focus habitat enhancement activities in all lower basin tributaries described in Section 2. To date the project has focused activities within Swale Creek, and to a lesser degree the Little Klickitat River. These basins were selected as a starting point based on their obvious need for habitat enhancement, local landowner support, and a manageable sized drainage.

Project tributaries are all located in south-central Washington within Klickitat County. The tributary watersheds range in size from Wheeler Canyon Creek 9.8 square miles to the Little Klickitat River at 282 square miles (Table 1).

Table 1. Drainage Areas

Tributary	Drainage Area (sq.mi.)
Dillacort Creek	11.9
Wheeler Canyon Creek	9.8
Snyder Creek	24.0
Swale Creek	126.0
Little Klickitat River	282.0
Summit Creek	44.8
White Creek	130.0
Trout Creek	102.0

These tributaries are characterized primarily by agricultural and range land, ponderosa pine / white oak transitional forests, and remnant wetlands. All are accessible to anadromous stocks

throughout their watersheds, but current habitat conditions limit spawning opportunities to the lower reaches in most cases.

Project Goal

The overall goal of the proposed project is elevated survival and production of salmonids in tributary streams of the lower Klickitat subbasin. The Project proposes to accomplish this goal through improvements to in-channel habitat and riparian conditions, and amelioration of water quality, and hydrology problems.

The objectives of the project include multi-agency watershed assessment of individual tributaries to guide project development. Techniques to be employed include: stabilization of stream banks and channels, introduction of large woody debris and structures to the channel, revegetation of riparian stands with deciduous and coniferous plant species, exclusion or management of livestock grazing in riparian areas, reduction of fine sediment transport, enhancement of summer flows for fish passage and rearing, and project monitoring. These objectives correspond with the habitat section of the Columbia River Basin Fish and Wildlife Program (NWPPC, 1994).

Through these restoration efforts, available habitat is anticipated to increase measurably for spawning, juvenile rearing, velocity refugia, and adult holding. In addition, water quality impacts, such as fine sediment delivery, will be moderated, and overall hydrologic conditions are expected to improve. This work will benefit both anadromous and resident salmonid populations, including steelhead, coho, and rainbow trout. Two of these anadromous runs in the Klickitat River (coho and winter steelhead) are considered depressed stocks in the Washington State Salmon and Steelhead Stock Inventory (SASSI, 1992).

Project Elements

The enhancement activities will include design plans with a description of existing conditions; actions needed to restore the channel and riparian areas to target conditions; the logistics necessary to complete the work; and benefits expected from the work. The approach for this project entails use of existing information, coupled with additional monitoring, to further identify and evaluate stream conditions. Critical stream segments for fish production and/or water quality protection will be targeted for restoration work. The strategy developed by the resource agencies involve restoring riparian habitats to lower basin tributaries includes the following project elements:

- In-Channel Riparian Enhancement;
- Riparian and Wetland Revegetation;
- Grazing management;
- Retention pond construction; and,
- Monitoring.

In-Channel Riparian Enhancement

The basic premise of the restoration efforts is that there is a lack of natural sinuosity and instream diversity due to the historic confinement and modification of the tributaries. Where channels are deficient in rearing habitat, restoration efforts may include restoration of historical side channel habitat, placement of large woody debris, boulders, and/or bank deflectors in the channel. This work is also expected to help retain / store spawning gravels. In areas of active bank erosion, bioengineering techniques may be utilized. These techniques will to include: establishment of dense woody vegetation for rooting strength and soil stabilization; placement of large rock at the base of eroding areas; and construction of rock bank deflectors to direct flows away from problem areas. In the lower reaches, side channels will be restored by removing rock material to reach subsurface flow. Upon review and acceptance of the plans a designated subcontractor, will

complete the work. The work will be evaluated by Project personnel for its consistency in meeting the design plans and project objectives.

Riparian Revegetation

Establishment of native riparian vegetation will be completed to enhance the riparian restoration activities proposed as part of this project. Where riparian areas contain little or no vegetation, plantings of coniferous and/or deciduous species will be completed to provide future material for wood recruitment to the channel, shade for temperature moderation, allochthonous nutrient delivery, and bank stability. The NWSA Watershed Restoration Team will be utilized to complete the revegetation activities proposed for this project.

Grazing Management

The grazing management component will supplement on-going work consisting of cross-fencing and water development to restrict livestock access to lower basin tributaries and/or limit the time and intensity of grazing. Exclosure fences are to be installed where grazing activities would continue to thwart establishment of beneficial vegetation, cause ground disturbance and bank erosion. Fencing will consist of standard wood post and barbed wire design with controlled livestock access points to the creek for watering. Off-stream watering tanks will also be included as part of the project to provide livestock watering points away from the riparian corridor. The NWSA Watershed Restoration Team will be utilized to construct the fencing. Portions of the fenced areas of the creek will be revegetated with native plantings.

Retention Pond Construction

These ponds will be designed by Natural Resources Conservation Service (NRCS), and created with earth-fill embankments fitted with a commercially available spillway. Each pond site will be located on actively managed pastureland, within existing intermittent drainages to larger tributaries within the lower Klickitat subbasin. The ponds will retain sediment and store water for groundwater recharge. The ponds will also provide habitat for a variety of wildlife species; in particular the ponds will provide open water habitat for waterfowl. Livestock will be excluded from the pond area by fencing.

Heavy equipment was used to move earth for the embankments, and the NWSA Watershed Restoration Team provided manual labor. Native soils will be utilized for constructing the retention pond embankments. The NWSA will revegetated the ponds with native plantings.

Monitoring

All specific project sites will have a Monitoring Plan completed by project personnel with restoration experience. Monitoring will be conducted both before and after restoration work. The monitoring (Timber Fish Wildlife Ambient Monitoring Protocol, Northwest Indian Fisheries Commission, 1992) will assess the habitat features (large woody debris, pool area and frequency, residual pool depth, spawning gravel quality and quantity), channel characteristics (wetted and bankfull width and depth), riparian condition (canopy cover, species composition), and fish population estimates (spawner surveys, electroshocking, snorkeling). Project monitoring and evaluation will include use of a photographic record coupled with on-site inspections and maintenance. The monitoring data will be analyzed to compare pre- and post-restoration habitat conditions, and provide a basis for additional action if necessary.

Monitoring will be conducted, at a minimum, for the duration of the twelve-year project period to assess changes to stream and riparian conditions, as well as fish populations. Follow-up surveys will be ongoing to determine the results of the project. Changes to habitat and riparian conditions, and water quality are anticipated to be measurable within the planned twelve-year

time frame of this project. However, changes to the riparian vegetation conditions may be less evident within the project period, especially establishment and recruitment of woody vegetation, which may take ten or more years for substantial growth.

b. Rationale and significance to Regional Programs

The rationale behind this project is improvements to riparian and in-channel conditions, as well as water quality, will elevate survival and production rates for salmonids. The objectives of the project (monitoring, planning, riparian enhancement, in-channel habitat development and bank protection, livestock management, wetland and retention pond construction, and land acquisition for permanent protection) are designed to comprehensively enhance habitat conditions and water quality. This approach supports the habitat objectives of the Columbia River Basin Fish and Wildlife Program. Project efforts should reduce fine sediment impacts on redds, improve bank stability, decrease summer stream temperatures, provide large woody debris to the stream, produce additional pool frequency, and enhance riparian vegetation. Past investigations in British Columbia and the states of Washington and Oregon have clearly shown the critical importance of in-channel habitat and adjacent riparian stands for salmonid production (Binns 1994, House 1996, Beschta 1991). Habitat enhancement and riparian revegetation work by the Yakama Nation in recent years has created additional rearing area and demonstrated use by juvenile salmonids. Projects initiated by the USFS in the Wenatchee National Forest have also increased the area available for salmonid rearing and have been shown to have juvenile salmonid use. The USFS also found, in some cases, an increased retention of spawning gravels.

It is expected that the project will provide immediate and future benefits to fish production, but the exact gains will not be known until monitoring is completed. In addition the length of time for complete stream recovery, or period until desired conditions are achieved, is not completely known. For example, optimal benefits from the revegetation of channel margins and riparian areas will require several years of plant growth.

Landowner agreements are likely to ensure that restoration work planned and implemented on their lands will be properly protected in future years.

c. Relationships to other projects

This habitat enhancement project is directly related to the other YIN restoration projects highlighted in Section 3. Project personnel will routinely share and disseminate information. YIN watershed projects will develop a pool of qualified subcontractor to carry out on-the-ground projects. Monitoring techniques and equipment can be shared between projects.

This project relates directly to WDFW Regional Enhancement Group (EG) efforts to restore stream habitat conditions within the Klickitat Basin. The EG has been instrumental in project development and enlisting community involvement. Additional, this project relates to the overall goal of the Klickitat portion of the Yakima Klickitat Fisheries Project (YKFP). The YKFP goal

is to restore anadromous fish runs to increase natural production and to improve harvest opportunities, while maintaining the long-term genetic fitness of the wild and native salmonid populations.

Project staff will provide scientific support to the Klickitat Watershed Assessment Team (WIRA # 30) recently formed under Washington State Legislative bill HR 2514, and HR 2496. Providing state approval of the Watershed Team, project staff will become active members in guiding basinwide habitat enhancement activities. This platform may provide additional cost-sharing opportunities in the near future.

Collaboration between Natural Resources Conservation Service (NRCS) and YIN continues by incorporating project goals and activities within the NRCS's Conservation Reserve Plan (CRP). Sediment retention pond construction is being located adjacent to lands incorporated into the CRP program to provide greater watershed protection.

d. Project history (for ongoing projects)

Since Project inception, public meetings have been held to describe the Project and to enlist landowner support. Increased public awareness has benefited this project tremendously, and will make Project expansion into adjacent tributaries more effective.

Early in 1997, an intensive one-month baseline stream survey (TFW 1994) of Swale Creek was completed by the NWSA. Results from this survey identified areas to direct restoration efforts along Swale Creek.

In 1997, first priority was given to construction of two miles of livestock enclosure fencing on the Max Fernandez sheep ranch. Construction of two sediment retention ponds to trap sediment-laden run-off before entering Swale Creek, were constructed on the Fernandez Ranch. Completion of final design drawings for the off-channel water system designed to disperse livestock grazing impacts to the riparian zone. Subcontract development with well drilling company for livestock watering system was completed. Developed agreement with Fernandez to move entire sheep wintering operation to new location, away from free-flowing water.

In 1998, one-half mile of cattle enclosure fencing on Patricia Martin property was installed. Completed design of a sediment retention/livestock-watering pond to permanently exclude cattle from this stretch of stream. Completed design of an additional sediment retention pond on the Martin property to restore wet meadow function and attenuate the Swale Creek hydrograph. Development of habitat improvement option with Stan Crocker, the largest single landowner on Swale Creek. Constructed 5 miles riparian enclosures on the Crocker Ranch. Developed strategies with Stan Crocker for additional fencing, riparian revegetation, and placement of instream structures within in his four plus miles of stream ownership.

Between 1997 and 1998 seven retention ponds have been constructed in upland areas of three different private lands adjacent to Swale Creek. The ponds, were designed by Natural Resources Conservation Service (NRCS), and created with earth-fill embankments fitted with a commercially available spillway. Each of the pond sites is located on actively managed pastureland, within existing intermittent drainages to larger Swale Creek. Each site has a small

seasonal drainage channel with varying degrees of channel erosion taking place. The seven retention ponds inundate an average of 0.47 acres of land (Table 2). The ponds retain sediment and store water for groundwater recharge.

Table 2: Retention Pond Parameters

Property Owner	Legal Description	Watershed Area (Acre)	Pond Surface Area (Acre)	Pond Capacity (Acre-Feet)
Patricia Martin #1	T3N R14E S22, NW of SE	551.0	1.25	4.40
Patricia Martin #2	T3N R14E S22, SW of SW	81.7	0.37	1.57
Charles Eshelman #1	T3N R15E S4, SE of NW	120.0	0.38	1.13
Charles Eshelman #2	T3N R15E S4, NE of SE	202.0	0.40	1.50
Max Fernandez #1	T3N R14E S25, SE of SE	500.0	0.35	1.00
Max Fernandez #2	T3N R14E S25, SE of NE	550.0	.25	3.20
Max Fernandez #3	T3N R14E S25, SW of SE	117.0	0.26	0.52

Heavy equipment was used to move earth for the embankments, and the NWSA Watershed Restoration Team provided manual labor. Native soils were utilized for constructing the retention pond embankments. The NWSA revegetated the ponds with native plantings.

e. Proposal objectives

The objective of the project is to improve spawning, rearing and holding habitat, stabilize stream banks and channels, revegetate riparian corridors with beneficial deciduous and coniferous species, deter grazing impacts to the riparian area and stream channel, and provide adequate summer flows for fish passage and rearing. The project work is also expected to improve water quality by reducing erosion, filtrating and storing fine sediments, augmenting canopy cover for temperature moderation and reducing livestock waste from entering waters. Through restoration efforts on the channel, available habitat is anticipated to increase by at least two-three fold for spawning, juvenile rearing, velocity refugia, and adult holding. These improvements should benefit both anadromous and resident salmonid populations in the Klickitat River. Ambient monitoring of habitat conditions and fish populations before and after completion of project work will quantify whether objectives were attained.

The goal of the project will be enhancement of habitat conditions and water quality within important anadromous stream reaches of Lower Basin Tributaries. To achieve the goal, several objectives are proposed. Immediately prior to project inception WDFW funded an intensive stream inventory to identify areas of where impacts to stream habitat were most severe. The identification of habitat and riparian problems will be developed through researching existing information and pre-Project monitoring. Previous monitoring by Yakama Nation personnel and the Washington Department of Ecology has identified problems with stream temperatures and in-stream flows in some of these lower Klickitat River tributaries (section 303d list of water quality impaired streams of Washington, Yakima/Klickitat Natural Production and Enhancement Program, 1989, 1990, 1995). In addition, many of the project streams have been identified by Yakama Nation personnel to lack pool area, large woody debris, pool depth, overhead cover, and spawning gravel quantity and quality.

The first project objective (1.a-d) was to develop a watershed assessment team of local professionals and enlist landowner support and subsequent involvement. This was accomplished through mailings, radio announcements and town meetings. This objective will also coordinate with watershed assessment activities currently, in the formulation stage with Klickitat County under the HR 2514 legislation.

After initial information gathering it was determine the second project objective (2.a-d) should be to restore riparian health and vigor. This was approached by the design and installation of cattle enclosure fencing, riparian revegetation and development of off-channel watering systems.

The third project objective (3.a-b) was determined to be the control of fine sediment delivery into the Project tributaries. Due to the extensive agricultural use in the upper basin fine sediment delivery into the stream channel has been accelerated. The increased drainage density and unnatural hydrograph spike as a result of agricultural practices have necessitated installation of sediment retention ponds at strategic locations in the basin.

The fourth project objective (4.a) is the installation of earthen ponds at strategic locals to restore wet meadow function to the upper basin of Project tributaries. This activity will help restore a natural hydrograph to the system. The increased baseflow will deliver cooler water to the system throughout summer months.

The fifth project objective (5.a-b) to actively pursue the purchase of key piece of habitat though willing landowners. Through the initial stream inventory areas of key spawning and rearing habitat were identified and prioritized. A land ownership map was then developed by project staff and will be used to pursue acquisition or develop a conservation easement with willing landowners.

The sixth project objective (6.a-b) is enhancement of stream segments lacking optimum habitat conditions (pool area, large woody debris frequency, spawning gravel quantity and quality, velocity refuge) and reduction of bank and channel erosion.

The seventh project objective (7.a-d) is the monitoring of riparian and in-channel restoration efforts. Annual TFW Ambient Monitoring will be conducted to monitor changes over time. Habitat inventories and salmonid population surveys will be conducted in all stream segments identified in the basin. An important component of TFW monitoring is photo documentation to identify areas of project success or failure.

f. Methods

The formulation of a watershed assessment team as described in the Washington Forest Practices Board, Standard Methology for Conducting Watershed Analysis will be followed in an abbreviated fashion. The following seven points will be developed in detail for each Project tributary under consideration:

1. Identifying leaders
2. Identifying land owners
3. Notify land owners and request information
4. Gather starting information
5. Identify resource assessment alternatives
6. Begin resource assessment
7. Develop prescriptions
8. Monitor project

Much of this project area contains private lands. This project will continue to coordinate and seek cooperation from landowners to permit restoration work on their lands. Several landowners have already expressed interest in stream restoration and would like to participate in this project. In areas of critical habitat where cooperation can not be obtained, easements or land purchase may be sought to allow restoration work to take place.

All specific project sites will have a design and monitoring plan completed by the grantee or a subcontractor with restoration experience. Monitoring will be conducted both before and after restoration work. The monitoring (TFW Ambient Monitoring Protocol) will assess the habitat features (large woody debris, pool area and frequency, residual pool depth, spawning gravel quality and quantity), channel characteristics (wetted and bankfull width and depth), riparian condition (canopy cover, species composition), and limited fish population estimates (spawner surveys, electroshocking, snorkeling). The monitoring data will be analyzed to compare changes before and after the restoration work.

The design plans will include a description of existing conditions; actions needed to restore the channel and riparian areas to target conditions, logistics to complete the work, expected benefits from the work. Where channels are deficient in rearing habitat, restoration efforts may include placement of large woody debris, boulders, and or bank deflectors in the channel. This work is also expected to help retain/store spawning gravels. In areas of active bank erosion, bio-engineering practices may be utilized such as establishment of dense woody vegetation for rooting strength, placement of large rock at toes of erosion, and construction of bank deflectors to direct flows away from banks. In addition, exclosure fences may be installed where grazing activities would continue to thwart establishment of beneficial vegetation and cause ground disturbance and bank erosion.

Within riparian areas, stands with sparse or no vegetation may be inter-planted with appropriate coniferous or deciduous species to provide future wood recruitment to the channel, shade for temperature moderation, allochthonous nutrient delivery, and bank stability. Irrigation diversions, which cause inadequate summer stream flows for fish rearing and migration, may have water rights purchased to retain in-stream flows. Upon review and acceptance of the plans, the grantee or a subcontractor will carry out the work. The work will be evaluated by the grantee for its consistency in meeting the design plans and project objectives.

Adaptive management practices are being used throughout project design and implementation. Associated projects within and outside the Klickitat Basin will be analyzed and project success incorporated into project strategies.

g. Facilities and equipment

Indirect cost will be used for office rental and overhead for project staff. No other facilities will be required by this project.

Equipment used for this project will be primarily fencing, fence building materials, livestock watering devices and revegetation supplies. Specialized monitoring equipment such as camera, vegetation survey tools, vegetation identification materials will be purchased.

Local contractors will be employed to perform heavy equipment operation for sediment retention pond construction, and in-channel work.

h. Budget

Personnel costs for this project consist of 1/3 FTE for YIN bookkeeper. The remainder of this person's salary is from several BPA / YIN sponsored watershed projects. The remaining project staff are professionals from YIN, WDFW, and NRCS contributing on a no-cost basis.

Project materials and supplies consist of fencing and fencing related supplies. Additional materials include revegetation materials such as, native grass seed and rooted stock. When possible local cuttings are collected for revegetation to minimize this cost.

O&M costs include monitoring equipment, and maintenance costs of existing fences and livestock watering systems.

Capital costs for this project include well drilling and associated pumps for off-channel water development. Within this line item are land acquisition costs. In 1997 funds were insufficient to purchase any critical habitat for the project. For the 2000 proposal the amount for land acquisition was increased to reflect project staff's increased knowledge of land values and availability.

NEPA costs are not anticipated for the 2000 project proposal. During 1998 operation BPA subcontracted out Watershed EA and BO project costs directly.

Subcontractor costs include all phases of on-the-ground implementation. The NWSA has been contracted to provide labor for all fencing and revegetation tasks. Local construction contractors are employed to construct in-channel structures, sediment retention ponds, and off-channel water systems.

Section 9. Key personnel

Principal Investigator

Name: Lynn Hatcher

Address: 1380 Orchardvale , Zillah, WA 98953

Birthdate: February 10, 1951, Wichita, Kansas
Nationality: U.S.
Sex: Male

Education: High School: Mount Rainier, Des Moines, Washington, 1969
Bachelor of Science, College of Fisheries, University of Washington
1974

Work Experience: National Marine Fisheries Service: Summers 1970, 1971, 1972.

Participated in fur seal harvest and tagging studies on
St. Paul Island, Alaska.

Quinault Indian Nation, Fisheries Biologist, 1974 to 1979.

Supervised:
Adult Escapement and enumeration studies for
assessment of salmon and steelhead run dynamics.

Supervised and designed:
Aquatic productivity studies.

Participated in a wide range of aquaculture activities
including brood stock acquisition, spawning operations,
incubation, fry and smolt rearing, sampling, tagging,
and release.

1980 Puget Sound Power and Light Company, Fisheries Biologist 1979-

Supervised:
Skagit River Aquatic Resources Program.

Yakama Indian Nation, Fisheries Biologist 1980-1982,

Supervised:
Data collection and analysis for tribal fisheries staff.

Yakama Indian Nation, Fisheries Program Manager, 1983-Present.

Supervised and Managed:
A team of professionals engaged in a variety of fisheries
management activities.

Achievements:

National Marine Fisheries Service Incentive Award: 1970, 1971, 1972.

Yakama Nation Supervisor of the Year Award: 1991, 1996

Project Manager

William Sharp, YIN Fisheries Biologist
Bachelor of Science in Natural Resource Management with minor in Watershed Science.
Colorado State University 1987.

Instream Flow Incremental Methodology (IFIM) certification Colorado State University 1988.

Current Employer:

Yakama Indian Nation Fisheries Resource Management Program
PO Box 151, Toppenish, WA. 98901
5/1989 to present

Current Responsibilities:

Project Manger of BPA project 9705600. No salary is used to pay this employee as; duties from BPA project #9506800 cover project participation. Duties include; watershed team development, project design and development, data analysis and synthesis, report writing, budgeting, and subcontract development.

Project Manger for BPA project #9506800 1 FTE. This includes research design and development, daily field operation, data analysis and synthesis, report writing, budgeting, and subcontract development.

Recent Previous Employment:

U.S. Fish and Wildlife Service, Vancouver, WA.
August 1988 – May 1989
Conducted IFIM study on rivers throughout Oregon and Washington

Idaho Fish and Game, Region 3, Boise, ID.

March 1987 – October 1987

Constructed and operated adult and juvenile fish trapping facilities, snorkel and adult spawner surveys.

US Army Corps of Engineers, Walla Walla and Portland Districts

1983 – 1986

Conducted radio telemetry studies at five mainstem Columbia River Hydroelectric dams.

I have over twelve years of Pacific Northwest fisheries work experience. I have designed and implemented fisheries and habitat studies analyzed and presented data. I have managed field crews from 2-20 individuals. I have worked on habitat construction projects in the Yakima basin where we've constructed off-channel rearing structures, alcoves and velocity refugia to benefit depressed spring chinook stocks. As the lead biologist on the Klickitat Project 9506800 I have conducted all aspects of project design, budgeting, salmonid population monitoring at all life stages and stream habitat inventory.

Assistant Project Manager

William Weiler, Regional Volunteer Coordinator
Swale Creek Project On-Site Coordinator, ¼ FTE on Project # 9705600
Master of Science, Natural Resource Management, George Williams College, Chicago, IL. 1979
Bachelor of Science, Wildlife Biology, Oregon State University, Corvallis, OR. 1976

Current Employer:
Washington Department of Fish and Wildlife
1701 S. 24th Ave.
Yakima, WA. 98902

Current Responsibilities:
Project coordination with YIN. Meet with landowners and formulate restoration plans.
Supervision of 10 Americorps crewmembers assigned to project.
Order and distribute tools and materials. Consult with other agencies, pursuing expertise in fence building, and restoration practices.

Section 10. Information/technology transfer

The technical information resulting from this project (and its component tasks) will be distributed in the following ways:

- A completion (annual) report will be submitted to Bonneville at the close of the fiscal (calendar) year. Bonneville will distribute copies to all individuals and agencies on its mailing list.
- The project's tact of working with other agencies and landowners will increase awareness of restoration efforts. Positive results of the work will also be communicated to the local community.
- The work will be visible to the general public due to its relatively close proximity to roads and highways. Interpretive signs will be placed near project sites to inform the public of the work and effort completed.
- Local newspapers will be contacted to disseminate project information.
- TFW Ambient monitoring results will be presented in annual report along with photo documentation of restored areas.

Congratulations!