
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Protect And Restore The Lolo Creek Watershed

BPA project number: 9607708
Contract renewal date (mm/yyyy): 3/2000 **Multiple actions?**

Business name of agency, institution or organization requesting funding
Nez Perce Tribe Fisheries/Watershed Program

Business acronym (if appropriate) NPT

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses
2.2C; 7.6A1-6; 7.6B1-6; 7.6C.2; 7.6C.5; 7.6D; 7.7A.1; 7.4A.4; 7.8A.1-6; 7.8D.1

FWS/NMFS Biological Opinion Number(s) which this project addresses
Land and Resource Management Plans for National Forests and Bureau of Land Management Resource Areas in the Upper Columbia Basin and Snake River Basin Evolutionary Significant Units, 1998.

Other planning document references

Columbia River Basin Fish and Wildlife Program; Wy-Kan-Ush-Mi Wa-Kish-Wit, Spirit of the Salmon, The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes; Clearwater River Subbasin Salmon and Steelhead Production Plan; Clearwater Subbasin Ecosystem Analysis at the Watershed Scale;

Short description

Protect, restore, and enhance the Lolo Creek Watershed to provide quality habitat for Chinook salmon, Coho salmon, Steelhead trout, Pacific Lamprey, and resident fish. This will be accomplished by working with an overall watershed approach.

Target species

Chinook salmon, Coho salmon, Steelhead trout, Pacific Lamprey and resident fish.

Section 2. Sorting and evaluation**Subbasin**

Clearwater subbasin, Lolo Creek Watershed

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 checked="" type="checkbox"/> Multi-year (milestone-based evaluation) <input checked="" type="checkbox"/> Watershed project evaluation	<input type="checkbox"/> Watershed councils/model watersheds <input type="checkbox"/> Information dissemination <input checked="" 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
8335000	Nez Perce Tribal Hatchery	Supplementation
9608600	Clearwater Focus Coordinator Idaho Soil Conservation Commission	Co-coordinator for Clearwater River Subbasin
9600600	Clearwater Focus Watershed/Co-coordinators	was in umbrella table
9607709	Protect & Restore Squaw & Papoose Creek Watersheds	was in umbrella table
9607711	Restore McComas Meadows/Meadow Creek Watershed	was in umbrella table

9901700	Rehabilitate Lapwai Creek	was in umbrella table
9901600	Protect & Restore Big Canyon Creek Watershed	was in umbrella table
20087	Protect and Restore Mill Creek Watershed	was in umbrella table
20085	Analyze and Improve Fish Screens	was in umbrella table
20086	Rehabilitate Newsome Creek Watershed	was in umbrella table
20084	Protect and Restore North Lochsa Face Watershed Analysis Area	was in umbrella table

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1997	Construct 3.1 miles of fence for riparian and cultural protection.	Exclude grazing effects from impacting riparian areas and cultural resources.
1997	Construct 0.5 miles fence to protect a prime spawning area	Exclude grazing effects from impacting riparian areas and cultural resources.
1997	Completed 12 miles of road obliteration consisting of erosion control, re-vegetation, fertilizing, and placing of woody debris.	Eliminate roads as a susceptible sediment source.
1998	Maintenance and monitoring of construction of 3.1 miles of riparian fence.	N/A
1998	Construction of 10 miles of riparian protection fence.	Exclude grazing effects from impacting riparian areas and cultural resources.
1998	Installation of two cattleguards.	N/A
1998	Installation of one off-site watering development to keep grazing in the uplands and out of the riparian areas.	N/A
1998	Completed 15 miles of road obliteration, consisting of contouring the roadbeds back to their natural slope, re-vegetation, fertilization, and placing of woody debris.	Eliminate roads as a susceptible sediment source.

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Protect and enhance critical riparian habitat as it creates fish and wildlife habitat.	a	Coordinate with Coordinated Resource Management (CRM) and private landowners to protect critical habitat from grazing through the construction of fence.
		b	Construct stream and riparian protection fence.
		c	Operation and maintenance of riparian fence.
2	Enhance bank stability within Lolo Creek watershed, starting with tributaries.	a	Coordinate with CRM to implement bank stabilization techniques.
		b	Develop permit package.
		c	Purchase materials for bank stabilization, such as erosion control matting and seed.
		d	Implement bank stabilization techniques.
3	Restore riparian plant communities (native plants and trees) to enhance fish and wildlife habitat, reduce sediment delivery to stream, stabilize stream banks, and improve water quality.	a	Evaluate re-vegetation design based on the management plan/watershed assessment.
		b	Collect cuttings and seed from local source.
		c	Grow seeds and store cuttings in cold storage.
		d	Purchase additional container seedlings.
		e	Plant cuttings and container seedlings in riparian zone areas in need of habitat and stabilization.
4	Monitor and evaluate success of fence in excluding cattle from grazing effects on riparian habitat.	a	Evaluate over-winter survival of fence during early spring months by walking the entire fence line.
		b	Repair any damaged or destroyed sections of fence.
5	Monitor and evaluate success of road obliteration.	a	Coordinate with Clearwater National Forest (CNF) to perform monitoring and evaluation of road obliteration activities.

		b	Continue use of Challenge Cost Share Agreement, and make annual revisions, as needed.
		c	Walk all obliterated roads to measure vegetation growth, stabilization, and new failures.
		d	Analyse all data within Lolo Creek Watershed relating to road obliteration including, but not limited to sediment, cobble embeddedness, and water quality, through stream surveys.
6	Manage project to effectively accomplish project goals.	a	Develop project time schedules
		b	Update and communicate with all entities involved in Cordinated Resource Management (CRM) group.
		c	Share information with all interested parties.
		d	Prepare quarterly and annual reports.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	12/1999	12/2000	N/A	X	10.00%
2	12/1999	10/2000	N/A	X	30.00%
3	11/1999	7/2000	N/A	X	15.00%
4	3/2000	7/2000	N/A	X	10.00%
5	2/2000	11/2000	N/A	X	25.00%
6	12/2000	12/2000	N/A		10.00%
				Total	100.00%

Schedule constraints

Severe/Inclement weather.

Completion date

2006

Section 5. Budget

FY99 project budget (BPA obligated): \$361,062

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel		%42	85,615
Fringe benefits	14% Tax-Exempt, Perm. Staff 24% Non-Tax-Exempt, Perm. Staff	%8	15,455
Supplies, materials, non-expendable property	Office supplies, Planting bars/augers, seed, erosion control matting, vegetation.	%3	5,550
Operations & maintenance		%0	
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		%0	
NEPA costs		%0	
Construction-related support	Excavator operator (\$6,000)-- Subcontract	%5	9,500
PIT tags	# of tags:	%0	
Travel	GSA vehicle lease, Training, Conferences and perdiem costs.	%16	32,680
Indirect costs	22.9%	%16	31,950
Subcontractor	Road Obliteration Monitoring & Fence Materials	%11	23,000
Other		%0	
TOTAL BPA FY2000 BUDGET REQUEST			\$203,750

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount (\$)
Clearwater National Forest	Road obliteration monitoring, Fisheries Expertise	%4	8,100
Earth Conservation Corps/Salmon Corps	Labor - tree planting & assistance with monitoring	%0	500
Potlatch Corpotation	Bank Stabilization, re-vegetation administration	%2	4100
		%0	
Total project cost (including BPA portion)			\$216,450

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	\$150,000	\$150,000	\$100,000	\$100,000

Section 6. References

Watershed?	Reference
<input checked="" type="checkbox"/>	Clearwater National Forest. 1997. Clearwater Subbasin Ecosystem Analysis at the Watershed Scale. Clearwater National Forest, Idaho.
<input type="checkbox"/>	Clearwater National Forest. 1998. Clearwater National Forest Watershed and Fisheries Monitoring Plan. Clearwater National Forest, Idaho.
<input type="checkbox"/>	Clearwater National Forest and Nez Perce Tribe. 1998. Challenge Cost Share Agreement.
<input checked="" type="checkbox"/>	Clearwater Soil & Water Cons. Dist., ISCC, USDA SCS, and Idaho DEQ. 1993. Agricultural Pollution Abatement Plan, Lolo/Ford's Creek Watershed. Final Planning Report, Clearwater and Idaho Counties, Idaho.
<input type="checkbox"/>	CRITFC. 1995. Wy-Kan-Ush-Mi Wa-Kish-Wit, Spirit of the Salmon, The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes. Volume I & II, Portland, Oregon.
<input checked="" type="checkbox"/>	Landowner Steering Committee. 1997. Jim Brown Creek Coordinated Resource Management Plan. Potlatch Corporation, Headquarters, Idaho.
<input checked="" type="checkbox"/>	Nez Perce Tribe and Idaho Fish and Game. 1990. Clearwater River Subbasin Salmon and Steelhead Production Plan. Lapwai and Boise, Idaho.
<input type="checkbox"/>	Nez Perce Treaty of 1855 with the United States Federal Government.
<input type="checkbox"/>	Northwest Power Planning Council. 1994. Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council, Portland, Oregon.
<input type="checkbox"/>	Steward, Cleveland R. 1996. Monitoring and Evaluation Plan for the Nez Perce Tribal Hatchery. Nez Perce Tribe Department of Fisheries Resource Management.
<input type="checkbox"/>	USDA. 1997. National Indian Forest Resource Management Act, Public Law 101-630.
<input type="checkbox"/>	US Department of the Interior. 1998. Riparian Area Management, Process for Assessing Proper Functioning Condition. TR 1737-9 1993, Bureau of Land Management, Denver, Colorado.

PART II - NARRATIVE

Section 7. Abstract

The Lolo Creek Watershed restoration project began in 1996 through the Early Action Watershed Program to enhance fish habitat, reduce sediment delivery, and protect riparian areas from excessive grazing. The goals and objectives are achieved by working through a holistic watershed approach. Historically, Lolo Creek and its tributaries were damaged by logging, road building, mining, farming, and grazing. Stream temperatures approach lethal limits and riparian habitat has been destroyed. The overall goal of this project is to restore the diversity of physical and biological characteristics within the Lolo Creek Watershed to provide quality habitat for Chinook salmon, steelhead trout, Coho

salmon, Pacific Lamprey, and resident fish by working with a holistic watershed approach. This goal will be accomplished by protecting critical riparian habitat, establishing a riparian corridor through re-vegetation, and enhancing channel morphology through bank stabilization techniques. Monitoring and evaluation of fence construction and road obliteration will be conducted to evaluate the success of excluding cattle from riparian areas and reducing sediment delivery to the streams, respectively

Section 8. Project description

a. Technical and/or scientific background

The Lolo Creek Watershed, located within the Clearwater River subbasin, is 79,377 acres and contains critical Chinook salmon, steelhead trout, and resident fish habitat. “The Lolo Creek drainage was the most important spring Chinook production area within the mainstem Clearwater River drainage.” (Clearwater, 1997) Spring Chinook and steelhead trout spawned and reared in the upper reaches of Lolo Creek, but farming, grazing, conventional logging and road building have extensively altered stream channels. Chinook salmon and Steelhead trout are both listed under the Endangered Species Act within this subbasin.

The stream temperatures within Lolo Creek and its tributaries approach the lethal limits for salmonid production. Water temperatures are rated as poor during the spring Chinook spawning period, as well as for summer rearing of juveniles (Clearwater, 1997). Impacts from alterations in the riparian zone along the mainstem and the tributaries have caused increased summer water temperatures and a reduction in fish production in the lower reaches of the tributaries (Clearwater, 1997).

Brown’s Creek, a tributary to Lolo Creek, is a F-type channel, which is the classic entrenched, meandering channel. This channel type develops very high bank erosion rates. For this stream channel type, extensive re-vegetation, and bank placed boulders are recommended for rearing habitat enhancement (Rosgen, 1996). Roads have been built in the historical meander channel. This stream has high entrenched banks, which are cutting toward the road bed. Bank stabilization is needed in this tributary to reduce sediment delivery to the stream.

Riparian vegetation removed from the road right-of-way decreased the streamside shade and potential woody debris; high summer water temperatures and decreased quantity and quality of spawning and rearing habitats resulted. As more roads were constructed within the tributaries, additional sources of sedimentation were created in the smaller fish bearing tributaries as well as the mainstem of Lolo Creek. In 1997, the average road density in the Lolo watershed was 4.79 miles/square mile. The riparian alterations created stream channel instability, reduced streamside shade, higher summer water temperatures, and reduced instream habitat conditions (Clearwater, 1997).

Stream sedimentation is one of the major habitat protection concerns. The granitic Idaho Batholith is perceived as having severe erosion potential. Sedimentation from past land management activities in the Lolo Creek drainage has lowered the fish production potential (Nez Perce Tribe and Idaho Fish and Game, 1990).

Based on management plans and ecosystem analysis at the watershed scale, the Lolo Creek Watershed is clearly identified as a stream in need of habitat restoration. The adverse impact of in-stream sedimentation and increased water temperatures on both anadromous and resident fish cannot be overstated. Strong emphasis placed on assessing the conditions of riparian area adjacent to streams and tributaries of Lolo Creek is critical (Clearwater Soil and Water Cons. Dist. et. al., 1993)

The goals and objectives in our project strive toward meeting the goals and objectives found in Wy-Kan-Ush-Mi Wa-Kish-Wit, The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes (CRITFC, 1995).

GOALS OF TRIBAL FISH RESTORATION

- Restore anadromous fishes to the rivers and streams that support the historical cultural and economic practices of the tribes.
- Emphasize strategies that rely on natural production and healthy river systems to achieve this goal.
- Protect tribal sovereignty and treaty rights.
- Reclaim the anadromous fish resource and the environment on which it depends for future generations.

Putting fish back into the rivers and streams alone are not enough to restore their populations, as they require a healthy system to return, spawn, and rear. Our proposal objectives will mitigate the problems stated above by decreasing sediment to streams and rivers, in turn restoring spawning areas; produce riparian and stream bank habitat, resulting in decreased stream temperatures, increased rearing habitat, habitat for fish and wildlife, and stabilized stream banks; and excluding cattle from critical riparian and stream habitat, allowing the stream and riparian zone to grow and heal.

This project proposal also protects the goal of tribal sovereignty and treaty rights. In the Treaty of 1855, the Nez Perce Tribe ceded much of their aboriginal territory to the United States in exchange for a reservation that was to serve as a permanent homeland. In that treaty, the Nez Perce Tribe reserved certain rights including, “the exclusive right of taking fish in all the streams where running through or bordering said reservation is further secured to said Indians (Nez Perce Treaty of 1855, 1855).” Thus, the government has a trust agreement to protect all tribal resources. The proposal will work toward protecting our resources, therefore, fulfilling the governments responsibilities. The project will also allow the tribe to manage our own tribal resources, which will in turn protect our sovereignty and treaty rights. This is called for in the National Indian Forest Resource Management Act (PL 101-630), which provides for the management of forested tribal trust lands (USDA, 1997).

OBJECTIVES OF TRIBAL FISH RESTORATION

- Within 7 years, halt the declining trends in salmon, sturgeon, and lamprey populations originating upstream of Bonneville Dam.
- Within 25 years, increase the total adult salmon returns of stocks originating above Bonneville Dam to 4 million annually and in a manner that sustains natural production to support tribal commercial as well as ceremonial and subsistence harvests.
- Within 25 years, increase sturgeon and lamprey population to naturally sustainable levels that also support tribal harvest opportunities.
- Restore anadromous fishes to historical abundance in perpetuity.

The first objective states halting declining salmon and lamprey trends within 7 years. The past projects of riparian protection and road obliteration will produce stable stream banks by 2001. This is within the 7 year objective of the Tribes plan.

The Operation and Maintenance (O&M) and Monitoring and Evaluation (M&E) portions of this proposal will proceed with the upkeep of all past and ongoing projects. The repair and enhancement of past projects will continue the effort to restore and protect habitat for fish and wildlife. A continuing analysis of the watershed will identify current or potential problems that could interfere with meeting the tribes objectives. The effects of decreased sedimentation to the stream, will benefit water quality and fish habitat.

During the 1997 season, the Nez Perce Tribal Fisheries/Watershed Program, in cooperation with Earth Conservation Corps/Salmon Corps at Nez Perce and the Clearwater National Forest, obliterated 12 miles of road. Obliteration included contouring the road bed back to its original slope, erosion control, re-vegetation, and fertilization. 3.6 miles of fence were constructed with the Lolo Creek watershed to protect riparian and culturally significant areas.

In 1998, the existing 3.6 miles of fence was monitored for damage, and minor damage was repaired. An additional 10 miles of fence was constructed within the Mosquito, Brown's, and Musselshell Creeks (tributaries to Lolo Creek), to protect 21,000 acres of riparian habitat and tree plantations from grazing effects. Fifteen miles of road obliteration was completed within the Musselshell Creek drainage. This consisted of contouring the roadbeds back to their natural slope, re-vegetation, fertilization, and placing of woody debris.

Monitoring efforts by the NPT and the CNF will continue in 2000, as described in the MOU. Baseline data referring to sedimentation and cobble embeddedness has been collected. An continuation of data collection will proceed, and a statistical analysis will be computed in the out-years of this project. A monitoring plan will be in place to measure sediment decreases, as a result of road obliteration. Baseline data has been collected, and a statistical analysis will be compiled using monitoring data to determine the success of road obliteration.

b. Rationale and significance to Regional Programs

Protecting and restoring the Lolo Creek Watershed is called for in the objectives and goals of the *Wy-Kan-Ush-Mi Wa-Kish-Wit, Spirit of the Salmon*, The Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes (Volume I & II), as stated in section 8, part (a) of this proposal form. The objectives propose to serve an overall watershed plan to restore and protect the Lolo Creek Watershed; therefore, anadromous and resident fish and wildlife habitat will increase in population size, in turn protecting Nez Perce Tribal treaty rights and culture. Several agreements, verbal and written, have been made between various agencies and individuals to work with the Nez Perce Tribal Fisheries/Watershed Program in performing the objectives proposed for the Lolo Creek Watershed in 2000. A Challenge Cost-Share Agreement between the Clearwater National Forest and the Nez Perce Tribe has been used for all the work that was completed in 1997 and 1998, and will be used in 1999 and 2000. This agreement discusses the relationship between the parties with regard to watershed management within the Lolo Creek Watershed, as well as other watersheds within the Clearwater National Forest. Verbal agreements have also been made with Potlatch Corporation, Earth Conservation Corps, Idaho Department of Lands, and land permittees to complete the proposal objectives for 1999 and 2000.

Cattle grazing has had a great effect on fish habitat within the Lolo Creek Watershed, (CRITFC, 1995) Because of grazing, much of the riparian cover has been destroyed, and continued grazing on riparian area will not decrease the problem. A total of 13.6 miles of fence and two cattle guards were constructed in 1997 and 1998 to exclude cattle grazing from the riparian areas. In addition, a off-site watering development was installed in the uplands of Musselshell Creek. Historically, cattle move off ridge-tops, and move to the bottom lands for a water source, but this watering system will keep the cattle on the ridge-top areas and out of critical riparian habitat zones. Maintenance and upkeep to this watering system is required for this project year. Populations of riparian vegetation will be identified, and areas where a viable population is not present will be re-vegetated with a local source of native species. By decreasing the grazing traffic along the Lolo Creek drainage riparian corridor, and increasing the riparian corridor, healthy and productive fish populations will thrive within the Lolo Creek Watershed.

This project will directly benefit other fisheries projects funded by BPA. Under the Nez Perce Fisheries Program, the Nez Perce Tribal Hatchery (NPTH) will incubate and early rear fish in their facility, then release them into the natural environment to continue their freshwater rearing within the Lolo Creek drainage. Monitoring and Evaluation of production streams is critically important. For the production program to achieve success, habitat conditions are critically important to be as pristine as possible. The objectives of this proposal will work to benefit fish and wildlife habitat for the Nez Perce Tribal Hatchery projects.

Restoring the Lolo Creek drainage will work toward the goals of the Nez Perce Tribal Hatchery. Restoration will work to develop, increase, and reintroduce natural spawning

populations of Salmon in the Clearwater River subbasin. In addition, it will provide long-term harvest opportunities for Tribal and non-Tribal anglers within the Nez Perce Treaty lands within four salmon generations (20 years) following project completion (Steward, 1996).

This project also works toward the Habitat Objectives in section 7.6 of the *NPPC Fish and Wildlife Program* to limit sediment by first, ensuring no increase in sediment input from human activities. Also, limit the percentage of fine sediment to no more than 20 percent, and limit the cobble embeddedness to less than 30 percent or documented historic condition. It will also work toward the overall goals and objectives of the Anadromous Fish Restoration Plan of the Tribes (CRITFC, 1995) in returning salmon to the rivers and streams above Bonneville Dam and restoring healthy river systems. Funding in 2000 and out-years will make it possible to add to these habitat improvements within the Lolo Creek drainage.

c. Relationships to other projects

The Nez Perce Tribal Fisheries/Watershed Program has been actively involved in the Clearwater Sub-basin with habitat restoration projects. The following list details the relationship to this project proposal.

- Clearwater Subbasin Focus Watershed Program – Coordinate multiple jurisdictions and government agencies efforts to protect, restore, and enhance fisheries habitat in the Clearwater River subbasin. Coordinate among federal, state, and local government agencies and private landowners in cooperation with the Idaho Soil Conservation Commission Focus Program. Project development will emphasize but not be restricted to lands co-managed by federal agencies and the Nez Perce Tribe in the Clearwater River subbasin. Manage implementation projects to enhance or restore fisheries habitat in selected watersheds.
- Meadow Creek Restoration–Idaho – Increase understanding of meadow restoration through academic graduate work by comparing low impact vs. aggressive mechanical restoration methods within Meadow Creek and Red River in the South Fork Clearwater River.
- McComas Meadow/Meadow Creek Watershed – Re-vegetate and restore riparian and wetland habitat through stream bank stabilization, excluding grazing effects, and groundwater monitoring.
- Squaw and Papoose Creek Watersheds – Improve spawning and rearing habitat through road obliteration/erosion control activities, and perform monitoring and evaluation of road obliteration and sediment reduction procedures.
- Lapwai Creek Watershed – Complete watershed assessment to justify further work within the watershed, and coordinate with private landowners within proposed work area.
- Big Canyon Creek Watershed – Complete watershed assessment to justify further work within the watershed, and coordinate with private landowners within proposed work area.

- Mill Creek- Construct fence to protect critical spawning habitat within the Mill Creek Watershed.
- Newsome Creek – Obliterate roads to reduce sediment delivery to the stream, and monitor channel morphology.
- North Lochsa Face – Improve spawning and rearing habitat through road obliteration/erosion control activities, and perform monitoring and evaluation of road obliteration and sediment reduction procedures.
- Fish Screens – Analyze and Improve fish screens on pumps and diversions within the 1855-treaty territory of the Nez Perce Tribe.

All projects are located within the Clearwater River subbasin, and consistent with their goals and objectives of the 1994 Fish and Wildlife Program (FWP) including: sharing costs with relevant parties (Nez Perce National Forest), ensuring biodiversity through conserving landscapes, ecosystems, species, and populations through riparian protection, sediment reduction activities, habitat protection and rehabilitation, stream bank regeneration and rehabilitation, continue land management, increase survival of native anadromous and resident salmonids.

d. Project history (for ongoing projects)

The Nez Perce Tribal Fisheries/Watershed Program has been involved in road obliteration within the Lolo Creek Watershed since 1997, under BPA contract number 96-077-00. A Challenge Cost-Share Agreement between the Clearwater National Forest and the Nez Perce Tribe (CNF and NPT, 1997) was produced, signed by both parties, and used during the 1997 year to obliterate and re-vegetate 12 miles of road within the Lolo Creek Watershed. In addition, during 1997, the watershed program constructed approximately 3.6 miles of riparian and cultural protection fence; 3.1 miles of fence was constructed around Musselshell Meadows for riparian and cultural resource protection, and 0.5 miles was constructed to protect a prime spawning area within Lolo Creek. Our costs associated with the road obliteration and riparian/cultural resource protection in 1997 was approximately \$130,900.

During fiscal year 1998, a Challenge Cost-Share Agreement between the Clearwater National Forest and the Nez Perce Tribe was signed by both parties to obliterate 15 miles of road, construct 10 miles of riparian/cultural resource protection, placement of two cattleguards, and installation of one off-site watering development. Road obliteration included contouring road beds back to their natural slope, erosion control, and re-vegetation in the Musselshell Creek drainage, a tributary to Lolo Creek. Ten miles of fence was constructed, including the installation of two cattleguards, within the Mosquito/Brown’s Creek drainage, a tributary to Lolo Creek to protect riparian areas, cultural resources, and tree plantations from grazing effects. A non-source watering system was installed within the Musselshell Creek drainage to keep livestock in the upland areas and out of the riparian zone during the summer months. Our costs associated with road obliteration, fence construction for riparian/cultural resource protection, cattle guard installation, and non-source-watering system in 1998 was approximately \$299,000.

Fence materials consisted of pressure treated lodgepole posts and four-strand barbed wire. Justification for using pressure treated lodgepole posts is that the snow loads encountered in this area are so heavy that steel posts become compacted into the ground within one winter season. Wooden posts are not as susceptible to heavy snow loads, and require little to no maintenance.

e. Proposal objectives

The overall project goal is to restore the diversity of physical and biological characteristics of the Lolo Creek Watershed to provide quality habitat for Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), Coho salmon (*Oncorhynchus kisutch*), Pacific Lamprey (*Lampetra tridentata*), and resident fish. To accomplish this goal, the following objectives are outlined.

Objective 1: Protect and enhance critical riparian habitat as it creates fish and wildlife habitat.

PRODUCT: The fence will exclude cattle from affecting the riparian zone. Excluding cattle from the riparian zone will result in enhanced fish and wildlife habitat.

Objective 2: Enhance bank stability within Lolo Creek watershed, starting with tributaries.

PRODUCT: Stable stream banks, reduced sediment delivery, and cooler stream water temperatures will enhance fish habitat and water quality.

Objective 3: Restore riparian plant communities (native plants and trees) to enhance fish and wildlife habitat, reduce sediment delivery to stream, stabilize stream banks, and improve water quality.

PRODUCT: Riparian habitat is improved by the restoration of native plant communities. Shade provided by riparian shrubs and trees benefit fish and wildlife habitat, water quality, and water temperature.

Objective 4: Monitor and evaluate success of fence in excluding cattle from grazing effects on riparian habitat.

PRODUCT: The fence will be in full functioning condition. Riparian habitat will improve through increased success of re-vegetation and water quality will improve as a result of excluding cattle from grazing.

Objective 5: Monitor and evaluate success of road obliteration.

PRODUCT: The Challenge Cost Share Agreement will continue between significant agencies. Knowledge of the success of road obliteration and improvements to water quality will be known. Reduced sediment delivery to the stream will improve turbidity and cobble embeddedness; therefore, the quality of spawning grounds will improve.

Objective 6: Manage project to effectively accomplish project goals.

PRODUCT: Produce quarterly and annual reports on progress and products of objectives and tasks.

f. Methods

Scope: To accomplish the project goal: restore the diversity of physical and biological characteristics of the Lolo Creek Watershed to provide quality habitat for Chinook Salmon, Coho Salmon, Pacific Lamprey, and resident fish, we will accomplish this using a holistic watershed approach. Our focus within this watershed is restoring the riparian community, and improving water quality to enhance fish and wildlife habitat. The stated objectives clearly represent an overall watershed approach to restoring the riparian corridor and improving water quality. In 2000, this project will (a) coordinate with significant agencies to accomplish the project goal, (b) enhance bank stability to reduce sediment delivery and cool stream temperatures, (c) restore native plant communities, (d) monitor and evaluate success of grazing exclusion, and (e) monitor and evaluate success of road obliteration for vegetation growth stabilization, failures, and sediment reduction.

Approach: The key element to stream restoration using a holistic watershed approach is restoring the physical and biological characteristics within the stream and riparian area. A stable environment will result from restoring these characteristics, benefiting not only the physical, but also the biological conditions which organisms live. Restoring the riparian corridor and reducing sediment delivery to streams will improve stream temperatures, and cobble embeddedness, respectively. Root systems along the riparian corridor will create stable stream banks, undercut bank habitat, and improve water quality by reducing sediment delivery to streams. Continued exclusion of grazing will allow riparian vegetation to grow and the stream bank to heal without disturbance. Monitoring of road obliteration will continue for five years after obliteration is completed. Water quality data, in particular sedimentation, will be collected on the impacted streams to be monitored and evaluated. A Challenge Cost-Share Agreement between the Nez Perce Tribe and the Clearwater National Forest was used in 1997 and 1998 for the work completed between the two parties. Potlatch Corporation, the State of Idaho, and private grazing permittees were also involved in the agreement in 1998. This agreement will be used again for the work completed in 1999, 2000, and beyond.

Critical Linkages:

- 1) Restoration of the riparian corridor is critical to the long-term habitat recovery of the Lolo Creek Watershed. This will be accomplished by restoring in-stream and canopy

cover, developing undercut banks, reducing water temperature, and reducing sediment delivery to the stream.

- 2) Establish habitat within the watershed to increase spawning and rearing habitat for fish, decrease stream temperatures, and decrease cobble embeddedness.
- 3) Coordinate with significant agencies (Forest Service, Potlatch Corporation, Idaho Department of Lands) to implement management plans, as outlined in their respective watershed assessments.
- 4) A long-term quality habitat is crucial to the survival of fish species that return to the Lolo Creek Watershed as a result of out-planting anadromous species by the Nez Perce Tribal Hatchery.

Detailed Methodology: (lower case letters refer to tasks)

- 1) Protect and enhance critical riparian habitat as it creates fish and wildlife habitat.
 - (a) Coordinate with Coordinated Resource Management (CRM) to define details of Challenge Cost Share Agreement. This agreement is used to define the responsibilities of each entity to combine project efforts and avoid duplication of tasks.
 - (b) Coordinate with significant agencies to design fence location. Fencing of riparian area will develop habitat for fish and wildlife. A riparian corridor establishes shade to reduce water temperatures, undercut bank habitat, and reduces sediment delivery to streams.
 - (c) Construct riparian protection fence to exclude cattle grazing from affecting prime habitat for fish and wildlife. The fence will exclude cattle from prime riparian habitat, and allow for enhancement of the riparian corridor and improve water quality.
 - (d) Maintain fence, previously constructed 13.6 miles, as well as additional fence, as a fully functioning fence for exclusion of cattle and grazing effects.
- 2) Enhance bank stability within Lolo Creek watershed, starting with tributaries.
 - (a) Coordinate with significant agencies to develop a design for bank stabilization, based on the watershed management plan. This coordinated effort will be defined in the Challenge Cost Share Agreement.
 - (b) All in-channel work proposed by this project requires two permits: (1) Nationwide Permit 4 (Section 404 of the U.S. Clean Water Act) issued by the U.S. Army Corps of Engineers and (2) Stream Alteration Permit (Section 42-3805 of the Idaho State Code) issued by the Idaho Department of Water Resources. The permit application package is prepared and submitted at least six weeks prior to the work start date. Permit applications include all design plans and specifications, mitigation plans, and suspended sediment mitigation plans.
 - (c) Purchase materials for bank stabilization, such as erosion control matting and seed. A stable stream bank environment reduces sediment delivery to the stream, increases storage capacity within the watershed, and provides quality fish habitat.

- (d) Upon permit approval, bank stabilization design techniques are implemented based on the details in the permit package. Approximately four miles of stream bank meanders will be stabilized through the use of structures and re-vegetation.
- 3) Restore riparian plant communities (native plants and trees) to enhance fish and wildlife habitat, reduce sediment delivery to stream, stabilize stream banks, and improve water quality.
 - (a) Evaluate re-vegetation design with significant agencies. This design will be based on management recommendations from the watershed assessment.
 - (b) Willow whips and alder seed will be collected from a local source during the fall/winter months while stocks are dormant. Local stocks will ensure genetic stability within the watershed.
 - (c) Seeds will be propagated, and whips will be stored in cold dark storage until planting time in the spring months.
 - (d) Purchase additional needed container seedlings that were native to the watershed. Native plants are the optimal vegetation in any area.
 - (e) Plant cuttings/whips and container seedlings in the riparian area to enhance stable banks, decreased water temperature, and improve water quality.
 - 4) Monitor and evaluate success of fence in excluding cattle from grazing effects on riparian habitat.
 - (a) Walk fence line which was previously constructed to evaluate over-winter survival of fence, and note location of any damaged or destroyed sections.
 - (b) Repair any damaged fence, referencing map to ensure all sections are repaired, to sustain a fully functioning fence. This fence will exclude cattle from riparian areas, therefore, increasing habitat and improving water quality.
 - 5) Monitor and evaluate success of road obliteration.
 - (a) Coordination between the CNF and the NPT, will define needs of monitoring within the Lolo Creek drainage as it relates to road obliteration.
 - (b) The Challenge Cost Share Agreement will define the responsibilities of each entity in working together to monitor the success of road obliteration.
 - (c) Walk all sections of obliterated road, in coordination with the Forest Service to measure vegetation growth, erosion control, and check for any new failures.
 - (d) Analyze all past data within the Lolo Creek watershed relating to sediment delivery to the streams. Current stream surveys will be conducted to measure sediment load, cobble embeddedness, and water quality. Past and present data will be analyzed to monitor success of road obliteration.
 - 6) Manage project to effectively accomplish project goals.
 - (a) The Nez Perce Tribe, the Clearwater National Forest, Potlatch Corporation, Idaho Department of Lands, and private grazing permittees will work as the CRM to complete project goals and objectives under a defined time schedule.
 - (b) The Nez Perce Tribe will update and communicate with the group to update all interested entities in the progress and problems encountered with the implementation of projects.

- (c) Information on the projects will be shared with all interested parties.
- (d) Project activity reports are prepared each quarter and a formal annual report is published. Reports are submitted to Bonneville Power Administration.

g. Facilities and equipment

Office space, computers, telephone, fax, photocopier, and various office equipment have been purchased in past years. The following equipment will be purchased, leased, or rented as follows:

- Pruner's (5) - purchase for use in clipping willow whips for riparian re-vegetation.
- Tree Planting bars (5) - purchased for use in planting willow whips.
- GSA vehicles (3) – leased for transportation to and from the job/work site.
- Excavator – rented for use in stream bank stabilization.
- Gloves (20) – purchase for use in fieldwork.
- ATV – owned for use in transporting fencing and bank stabilization materials.
- Post pounder (2) – purchase for use in fence construction.
- Wire stretcher (2) – purchase for use in fence construction.
- Fence post auger – purchase for use in fence construction.
- Computer – owned for use in data processing and report writing.

h. Budget

This budget will support one full-time Biologist and one part-time Technician to assist in habitat restoration responsibilities. A professional fencing crew will be hired to construct the riparian protection fence. Personnel and fringe benefits cost will cover the employee's salary and benefits offered through the NPT.

Supplies and materials costs contribute to office supplies, planting bars and augers used in re-vegetation of the riparian zone. Seed, erosion control matting, and vegetation are for use in bank stabilization.

The construction related support line will hire a contractor to operate the excavator that will be used for bank stabilization techniques, and to cover equipment costs used in riparian protection fencing.

Travel expenses cover the cost of leasing GSA vehicles for transportation to and from the work site, per diem costs for field crews, such as fencing and re-vegetation crews, and additional workshop, meeting, and conference costs related to this project.

Indirect costs of 22.9% of the budget, excluding sub-contracts, is allocated to the Nez Perce Tribe Executive Committee for the means of administration, human resources, and accounting support.

Sub-contracts will cover the cost of fencing materials and a consultant to assist with road obliteration monitoring. These same sub-contractors have been used in the past on BPA funded project in activities, such as cattleguard installation, off-site watering developments, water table well installation, and fencing material purchasing and delivery.

Section 9. Key personnel

Heidi Stubbers
Habitat Biologist
Nez Perce Tribe
1.0 FTE

Education: 1997 - B. S. – University of Dubuque, Iowa.

Majors: Environmental Science & Biology,

Current Responsibilities: Coordinate activities to include habitat, research, and production as it relates to watershed management, coordinate with cooperating agencies, work with interdisciplinary teams, inventory and evaluate habitat conditions, and coordinate riparian protection and stream restoration.

Relevant Training:

- Riparian Proper Functioning Condition Training, 1998, Bureau of Land Mgmt.
- Integrated Ecosystem Watershed Management Workshop, 1998, OSU
- Fish Screen and Passage Workshop, 1998, CBFWA
- Total Maximum Daily Load (TMDL) Workshop, 1998, Idaho DEQ
- Road Obliteration Training, 1998, USDA Forest Service

Previous Employment:

- May 1998 – present: NEZ PERCE TRIBE FISHERIES/WATERSHED
Habitat Biologist
- Sept. 1997 – May 1998: EARTH CONSERVATION CORPS/SALMON CORPS
Field Director
- Summers 1996 – 1997 – STATE OF IDAHO
DIVISION OF ENVIRONMENTAL QUALITY
Biological Technician

Expertise: Heidi has a broad educational background in environmental science and biology. Her professional experience includes a background working with habitat assessment, wildlife population counts, electrofishing, water quality testing, field research, and habitat restoration. Her work requires knowledge of habitat protection, restoration, habitat types, and the relation between them.

Relevant Job Completions: 1) McComas Meadow water table well installation, 2) McComas Meadow fence monitoring, 3) Lolo Creek fence construction & monitoring, 4) Lolo Creek non-source watering sites, 5) Johnson Creek Restoration Review.

Ira Jones
**Clearwater Subbasin Focus Coordinator/
Habitat/Watershed Manager**

1.0 FTE

Education: University of Montana, Missoula, MT

Major: Wildlife

Attendance: Sept 1973 – June 1974

Current Responsibilities: Planning and implementation of Early Action Watershed Projects, analyze programs, laws, policies related to watershed management, facilitate development of criteria to identify critical fisheries habitat, develop a system to apply criteria to watershed for project development and administration, prepare and plan documents for watershed habitat coordination, provide educational presentations and workshops for watershed management and proposal development, and provide assistance to project proponents with proposal development, implementation, monitoring and assessment.

Previous Employment:

- March 1997 – present: NEZ PERCE TRIBE FISHERIES/WATERSHED
Habitat/Watershed Manager
- June 1986 – March 1997: UNITED STATES FOREST SERVICE, REGION ONE.
Tribal Government Program Manager
- Dec. 1980 – June 1986: UNITED STATES FOREST SERVICE, REGION ONE.
Facilities Manager
- July 1974 – Oct. 1979 UNITED STATES FOREST SERVICE, REGION ONE.
Fire Cache Work Leader

Relevant Job Completions: 1) Coordinated National, Multi-Regional, and Regional Civil Rights Conferences. 2) Facilitated Treaty Rights workshops with host tribes and multi-government agencies. 3) Organized and conducted Tribal Relations Training primarily for management level from the U.S. Forest Service, Tribes, Bureau of Land Management, and the Bureau of Indian Affairs. 4) Introduced, implemented, and managed the Inter-Tribal Youth Practicums for careers in natural resources and leadership within the U.S. Forest Service Regions 1, 5, 9, and 10. 5) Developed an Intergovernmental Personnel Act (IPA) position to work with the Salish Kootnai College to teach environmental science courses and develop a four-year natural science curriculum at the college. This three-year position and the program developed into a four-year accredited degree program in the fall of 1996.

Emmit E. Taylor Jr.
Civil Engineer-In-Training
Nez Perce Tribal Watershed Program
1.0 FTE

Education: 1995 – BS in Civil Engineering – Colorado State University, CO

Current Responsibilities: Assist in gathering, analyzing, and interpreting watershed data; represent program in various inter-disciplinary teams; assist in surveying project areas; aide in assessing water resources/quality; knowledge of current computer software programs; design of civil engineering projects; supervise and field inspection of road obliteration; co-coordinate program projects.

Relevant Training:

- Riparian Proper Functioning Condition Training, 1998, Bureau of Land Mgmt.
- Road Obliteration Training, 1998, USDA Forest Service
- Applied Fluvial Geomorphology, 1998, Wildland Hydrology
- AutoCAD R14 Fundamentals, 1998, PacifiCAD Inc.

Previous Employment:

- August 1997 – present: *Nez Perce Tribal Fisheries/Watershed*
Civil Engineer-In-Training
- October 1995 – August 1997: *Womer and Associates Engineering and*
Architecture Firm
Civil Engineer-In-Training
- May 1993 – October 1995: *Colorado State University Tribal*
Tribal Transportation Program
Engineering Aide

Expertise: Emmit E. Taylor Jr.'s background is in Civil Engineering with an emphasis in hydrology. Mr. Taylor's analysis, design, and construction work concentrates on stream rehabilitation, stream morphology, water quality, road obliteration, in-stream structures, and fish passage improvements.

Relevant Job Completions:

1) Project leader and inspector of 24 miles of road obliteration, 2) Eldorado Falls Area Survey, 3) Squaw Creek Stream Survey and Analysis, 4) Colville Confederated Tribes HRD Building Site Development Design, and 5) Geiger Boulevard Environmental Analysis.

Felix M. McGowan

Nez Perce Tribal Watershed Coordinator

1.0 FTE

Education: 1994 – BA in Biology – Gonzaga University Spokane, WA

Current Responsibilities: Coordinate all activities within the Nez Perce Fisheries, wildlife, water resources, and cultural resources. These activities are to include habitat, research, and production as it relates to watershed management, coordinate with

cooperating agencies, work with interdisciplinary teams, inventory and evaluate habitat conditions, and coordinate riparian protection and restoration efforts.

Relevant Training:

- Riparian Proper Functioning Condition Training, 1998, Bureau of Land Mgmt.
- Integrated Ecosystem Watershed Management Workshop, 1998, OSU
- Road Obliteration Training, 1998, USDA Forest Service
- Introduction to GIS with ArcView 3.0a. 1998, BIA
- Applied Fluvial Geomorphology, 1998, Wildland Hydrology
- Coldwater Fish Culture, 1998, U.S. Fish & Wildlife Service

Previous Employment:

- May 1997 – present: *Nez Perce Tribal Fisheries/Watershed*
Nez Perce Watershed Coordinator

- August 1994 – April 1997: *North Idaho College*
Multicultural Academic Advisor

Expertise:

- Felix has a broad educational base in the natural sciences that allows an understanding of different natural processes. The training he has received over the past year has greatly increased his understanding in fisheries and hydrological sciences. These are two of the most important sciences involved in watershed work.

Relevant Job Completions:

- 1) Squaw Creek Stream Survey, 2) Squaw Creek Road Obliteration, 3) Lapwai Creek Watershed Assessment, 4) Johnson Creek Restoration Review, 5) Big Canyon Creek Watershed Assessment.

Janet Hohle, Clearwater Subbasin Focus Program Co-coordinator (1 FTE)

Education

Institution	Location	Attendance	Major	Degrees
Washington State University	Pullman, WA	6/92-8/94	Education	Ed.M
University of Idaho	Moscow, ID	1-6/92; 5/94	Education	n/a
University of Washington	Seattle, WA	1/77 - 8/78	Geology	B.S.
University of Iowa	Iowa City, IA	1971-1975 (52 hrs)	General	n/a

Certificates: Idaho: All subjects grades 1-8; Washington: Elementary education grades K-8; Earth Science Endorsement grades 4-12.

Professional Organizations: National Council Teachers of Mathematics; Phi Delta Kappa; Washington Science Teachers Association; Soil and Water Conservation Society.

Employment History

May, 1997 to Present **Clearwater Subbasin Focus Program Co-coordinator** Idaho Soil Conservation Commission. Moscow, Idaho. **Duties:** Analyze programs, laws, policies related to watershed planning, management, and restoration. Work with local groups to facilitate development of projects for fisheries habitat restoration that maximize subbasin agencies expertise, funding, and importance to aquatic species. Prepare documents for watershed habitat work coordination. Give educational presentations and workshops for watershed management and proposal development, implementation, compliance with NEPA and the ESA, monitoring, and assessment. Coordinate information and education outreach for projects coordinated through the Clearwater Focus Program. Provide assistance to project proponents with proposal development, implementation, monitoring, and assessment.

March, 1996 to May, 1997 **State Mineral/Aggregate Specialist** Oregon State Department of Land Conservation and Development. Salem, Oregon.

1994-1996 **Teacher** Substitute for grades 4-12 in Idaho and Washington school districts. Summer school science teacher-Upward Bound University of Idaho.

April, 1985 to November, 1991 **Geology Department Director** Colville Confederated Tribes. Nespelem, Washington.

April, 1982 to April, 1985 **Mineral Analyst** Colville Confederated Tribes. Keller, Washington.

January, 1979 to April, 1982 **Geologist** Colville Confederated Tribes. Nespelem, Washington.

The co-coordinator has extensive professional experience with interdisciplinary resource management, development, and problem solving in areas with multiple jurisdictional issues associated. During her tenure with Colville Confederated Tribes, the co-coordinator was responsible for competitive federal contracting. Demonstrated expertise includes resource issue coordination, public education, communication, and systems analysis.

Relevant Job Completions: 1) Data base compilations for system planning in the Clearwater River subbasin; 2) Legal interpretation and application of new Oregon State Administrative Rule for Goal 5 (natural) resources; 3) Statewide workshops in Oregon

to train county and state personnel on new Goal 5 Rule; 4) Mineral exploration and Development system design and implementation on the Colville Indian Reservation; 5) International mineral marketing campaign for the Colville Tribes Mount Tolman ore body.

We are also going to use staff from the Center for Environmental Education at Washington State University in our work within the watershed. The following individuals are the lead personnel from the university.

Shulin Chen

**Department of Biological Systems Engineering, Washington State University
Matching Funds Contribution**

Education: 1991 – Ph.D. Cornell University, Ithaca, NY
1981 – B.S. The Agricultural University of Hebei, Baoding, China

Current Reponsibilities/ Relevant Job Completions: Dr. Chen is in charge of both teaching and research projects for Washington State University. His teaching responsibilities include water quality, watershed management, natural systems for wastewater treatment, and aquacultural engineering. While his research projects include natural systems for agricultural wastewater treatment for USDA, a problem solving tool for mitigating the impact on water quality of management practices in small rural watersheds for USGS, wet detention pond for highway runoff control for NCHRP, and systems approach for watershed management for USDA.

Previous Employment:

- October 1995 – present Assistant Professor, W.S.U.
- November 1992 – Sept. 1995 Research Assistant Professor, L.S.U.
- January 1990 – Nov. 1992 Post-doctoral Researcher, L.S.U.

Expertise:

- Dr. Chen brings an expertise in water quality and management issues. This expertise will be used to review water quality information and help to apply this data to our work within this project. He also has expertise in environmental engineering which will help us in the design of instream and riparian structures.

Darin Saul

**Director, Center for Environmental Education at Washington State University
Matching Funds Contribution**

Education: 1996 – Ph.D. Washington State University, Pullman, WA.
1991 – M.A. Portland State University, Portland, OR
1987 – B.A. University of Washington, Seattle, WA

Current Responsibilities/Relevant Job Completions: Dr. Saul is the Director for the Center for Environmental Education and our liaison with WSU. He is currently working on the assessment model that will be used for Watershed Assessments completed by the Nez Perce Tribe. His experience in scientific writing and past watershed management publications will be invaluable in our efforts to establish a comprehensive document.

Experience:

- Director, Center for Environmental Education. 1996 – present
- Project Manager, Developing a Research Track In General Education Curriculum. 1997 – present
- Associate Director, WSU Preservice Teacher Environmental Literacy Project. 1996 – present
- Coordinator, Environmental Projects Program 1995 – 1996
- Adjunct Faculty at WSU 1997 – present
- Instructor and Teaching assistant 1990 - 1997

Publications:

- *A Next Step for Environmental Education: Thinking Critically, Thinking Culturally.* Accepted at The Journal of Environmental Education. Submitted February 1997.
- *Paradise Creek Watershed Water Quality Management Plan.* Co-written with Bruce Davis and the Paradise Creek Management for Washington Department of Ecology.
- “Intercultural Identity in James Welch’s *Fools Crow and The Indian Lawyer.*” American Indian Quarterly. Winter 1996, 1-6.

Section 10. Information/technology transfer

Information obtained from this project will be distributed through several documents. Streamnet will be used to document any relevant work completed in the watershed. Articles will be written and submitted to the Tribal Newsletter, Salmon Tales for publication.

Quarterly will be produced including project status, significant results, time lines, problems encountered, and upcoming planned activities. Annual reports will be published compiling all data and accomplishments achieved during the previous work season projects and improvement suggestions will be made for the upcoming years.

Congratulations!