PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Evaluate Bull Trout Population Status/N.F. Clearwater R. - Npt

BPA project number: 20147
Contract renewal date (mm/yyyy): ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Nez Perce Tribe SUB-PROPOSAL

Business acronym (if appropriate) NPT

Proposal contact person or principal investigator:

Name	Dana Weigel
Mailing Address	3404 Hwy 12
City, ST Zip	Orofino, ID 83541
Phone	(208) 476-9502
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Email address	weigeld@clearwater.net

NPPC Program Measure Number(s) which this project addresses
10.1C.3, 10.3C.6, 10.1C.1

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

Other planning document references
Section 6.6.5.3.A of the Resident Fish Multi-Year Implementation Plan for the Lower Snake Subregion (CBFWA 1997) calls for the need to ensure population levels of native fish in Dworshak and its tributaries are above minimum viable population size. Two documents evaluating the resident fish mitigation program in Dworshak Reservoir have identified the need for life history, habitat use, and effects of Reservoir operations on bull trout in the NF Clearwater basin. These studies also discuss the predator – prey relationship between introduced kokanee salmon and bull trout, and the beneficial effects of enhancing the kokanee populations on bull trout (Bennett 1997; Fickeisen and Geist 1993). The State of Idaho Bull Trout Conservation Plan (Idaho of Idaho1996) and IDGF's Mangement Plan (IDFG 1996) also address the need for bull trout protections.

Short description
Evaluate distribution, habitat use, and movment patterns of bull trout (Salvelinus confluentus) in the N.F. Clearwater River drainage, including Dworshak Reservoir.

Target species
Bull trout (Salvelinus confluentus)

Section 2. Sorting and evaluation

Subbasin
Clearwater

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
☐ Anadromous fish ☒ Resident fish ☐ Wildlife	☒ Multi-year (milestone-based evaluation) ☐ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☐ Operation & maintenance ☐ New construction ☒ Research & monitoring ☐ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

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

Project #	Project title/description
20557	Evaluate Bull Trout Population Status / N.F. Clearwater River - NPT & IDFG
20147	Evaluate Bull Trout Population Status / N.F Clearwater River - NPT
20148	Evaluate Bull Trout Population Status / N.F. Clearwater River - IDFG

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9501600	Genetic Inventory Westslope Cutthroat Trout	Assessment of a native trout species in N.F. Clearwater River Drainage--has identified distributions of bull trout in the basin and collected incidental observations on habitat

		use, developed methodologies to collect habitat and fish data in the basin.
8740700	Dworshak Impacts/M&E and Bio-Int Rule Curves	Assessment of reservoir operations on fish populations in Reservoir--has compiled baseline data on fish distribution in the reservoir and identified temperature and oxygen conditions that could act as barrier to migration into upper basin.
8709900	Dworshak Impacts Assessment	Assessment of entrainment- identifed the needed to assess the potential and impact of entrainment on reservoir fish associated with operations.
9405400	Bull Trout Studies in Central and N.E. Oregon	Study methods and protocols between studies are similar, and thus comparison between basins may lead to identification of regional patterns.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Identify bull trout subpopulations and determine the status of the bull trout subpopulations in the North Fork Clearwater River.	a	Tag juvenile and adult bull trout in the reservoir and throughout the North Fork Clearwater River basin and observe movements and spawning behaviors.
		b	Observe temporal habitat use (i.e., spawning, early rearing, wintering) and critical migratory corridors. Define spawning, early rearing, and winter habitat characteristics. Define critical migratory corridors.
		c	Determine distribution of bull trout

			(presence/absence). Estimate population structure (YOY densities). Conduct redd counts and identify breeding individuals. Assess condition and growth
2	Identify how Dworshak Reservoir and operations affect bull trout.	a	Track bull trout use of Reservoir.
		b	Identify movement in and out of the reservoir -seasonal trends, use of migratory corridors.
3	Develop and implement strategies to protect and perpetuate bull trout populations in the North Fork Clearwater River drainage.	a	Coordinate with other sponsored projects in the North Fork Clearwater River drainage to determine risks to bull trout subpopulations
		b	Implement strategies identified in Task 3a.
		c	Monitor and evaluate strategies implemented.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	1/2000	12/2005	Identification of populations and population viability	Completion of data collection phase	50.00%
2	1/2000	12/2005	Identification of reservior use and effects on populations viability	Completion of data collection phase	50.00%
3	6/2005	12/2005	Development of strategies to protect and perpetuate bull trout	Assessment of risks to the populations	
3	1/2006		Implementation, evaluation, and monitoring	Viable bull trout populations	
				Total	100.00%

Schedule constraints

Initiation of bull trout data collection is dependent on acceptance and approval of study plan and design by USFWS. A study plan and design will be submitted following ESA permit guidelines in 1999 to start fieldwork as scheduled in 2000.

Completion date

The initial data collection phase of proposed project will be completed in 2005.

Section 5. Budget

FY99 project budget (BPA obligated): $0

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	2 FTEs - Biologist and Technician, 2 1/3FTEs- Seasonals 1 1/2FTE- Administrative	%51	95,000
Fringe benefits	20% of personnel costs	%10	19,000
Supplies, materials, non-expendable property	Drysuits, snorkeling equipment, sampling equipment, waders, scales	%5	10,000
Operations & maintenance	rent, utilities, vehicle rent and gas	%5	10,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	scanners	%5	9,000
NEPA costs		%0	
Construction-related support		%0	
PIT tags	# of tags: 1000	%2	2,900
Travel	Flights, meeting registrations, training, field per diem	%4	7,000
Indirect costs	23%	%19	35,200
Subcontractor		%0	
Other		%0	
TOTAL BPA FY2000 BUDGET REQUEST			$188,100

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
IDFG	see IDFG subproposal	%0	
		%0	
		%0	
		%0	
Total project cost (including BPA portion)			$188,100

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	$197,600	$207,500	$220,100	$228,750

Section 6. References

Watershed?	Reference
☐	Allendorf, F.W. and R.F. Leary. 1988. Conservation and distribution of genetic variation in polytypic species, the cutthroat trout. Conservation Biology. 2:170-184.
☐	Bennett, D.H. 1997. Evaluation of current environmental and conditions and operations at Dworshak Reservoir, Clearwater River, ID and an analysis of fisheries mitigation alternatives. Final Report to the Army Corp of Engineers. Walla Walla, WA.
☐	Bisson, P.A. and others. 1998. Report of the Independent Scientific Review Panel. ISRP 98-1. Report to Northwest Power Planning Council. Portland, OR
☐	Bjornn, T.C., and J. Mallet. 1964. Movement of planted and wild trout in an Idaho river system. Transactions of the American Fisheries Society 93:70-76.
☐	Burns, D. C. and R. E. Edwards. 1985. Embeddedness of salmonid habitat of selected streams on the Payette national Forest. USDA Forest Service, Payette National Forest, McCall, Idaho.
☐	Columbia River Basin Fish and Wildlife Authority. 1997. Draft multi-year implementation plan for resident fish protection, enhancement, and mitigation in the Columbia River Basin. CBFWA Tech. Planning Document. Portland, OR
☐	Freeze, R.A. and J. A. Cherry. 1979. Groundwater. Prentice Hall, Inc. Englewood Cliffs, NJ. Freeze, R.A. and J. A. Cherry. 1979. Groundwater. Prentice Hall, Inc. Englewood Cliffs, NJ.
☐	Jearld, A. 1983. Age Determination. In Fisheries Techniques, ed. Neilson et al. American Fisheries Society, Bathesda, MD.
☐	Northwest Power Planning Council. 1994. Columbia River Basin Fish and Wildlife Program. Report 94-48. Portland, OR.
☐	Platts, W. S., W. F. Megahan, and G. W. Minshall. 1983. Methods for evaluating riparian habitats with applications to management. USDA, Forest Service, General Technical Report, INT-221.
☐	Rosgen, D. 1993. Short course on stream classification and applications. Wildland Hydrology Consultants, Pagosa Springs, Colorado.
☐	Sorensen, P.W., T.E. Essington, J. Cardwell, and D.E. Weigel. 1995. Hybridization and spawning behavior of brook and brown trout in a small stream. Canadian Journal of Fisheries and Aquatic Sciences. 52:1958-1965.
☐	Thurow, R.F. 1994. Underwater methods for study of salmonids in the intermountain west. USDA, Forest Service. Intermountain Research Station, General Technical Report, INT-GTR-307. 28pp.
☐	
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PART II - NARRATIVE

Section 7. Abstract

Little information is known about bull trout *Salvelinus confluentus* in the North Fork Clearwater River drainage. Surveys conducted by the Idaho Department of Fish and Game, Nez Perce Tribe, and other agencies have documented these fish in several streams in the drainage and in Dworshak Reservoir. However, the role Dworshak Dam and reservoir play in the life history of bull trout in the North Fork is unknown. Section 10.1C of the Councils Fish and Wildlife Program empowers fisheries managers to complete assessments of resident fish losses and gains related to the construction of each hydropower facility throughout the Columbia River Basin, and BPA to fund the completion of these resident fish assessments and identify the need for mitigation actions. As co-managers, the Nez Perce Tribe and Idaho Department of Fish and Game have identified the need to assess the losses and/or gains of bull trout in the North Fork Clearwater River related to the construction and operation of Dworshak Dam and associated reservoir. Baseline information on bull trout populations in the North Fork Clearwater River that is needed to assess the effect of the construction and operation of Dworshak Dam and Reservoir and develop strategies to protect and perpetuate the population(s) does not exist. We propose collecting bull trout movement and life-history information in the North Fork Clearwater River and Dworshak Reservoir over the next five years to assess 1) the role Dworshak Reservoir plays in movement patterns throughout the drainage, 2) the status (viability) of bull trout population(s) in the drainage system, and 3) the need for additional mitigative actions. Radiotags will be inserted in bull trout captured both in the reservoir and selected streams upstream of the reservoir. The movement of these fish, and information on the distribution and population structure of bull trout in the upper basin will be used to identify subpopulations, critical habitat, how, when and where bull trout use Dworshak Reservoir, and if use of the reservoir affects population viability. **This proposal addresses the specific tasks that will be done by the Nez Perce Tribe that are proposed in the co-authored Nez Perce Tribe and Idaho Department of Fish and Game umbrella proposal, *NPT & IDFG – Evaluate bull trout population status / N.F. Clearwater River.***

Section 8. Project description

a. Technical and/or scientific background

Description of technical background is presented in the umbrella proposal, *NPT & IDFG – Evaluate bull trout population status / N.F. Clearwater River.*

b. Rationale and significance to Regional Programs

The relationship and significance of this project to regional programs is presented in the umbrella proposal, *NPT & IDFG – Evaluate bull trout population status / N.F. Clearwater River.*

c. Relationships to other projects

The relationships of this project to other projects is presented in the umbrella proposal, *NPT & IDFG – Evaluate bull trout population status / N.F. Clearwater River.*

d. Project history (for ongoing projects)

There is no past history through this funding source.

e. Proposal objectives

Specific tasks associated with each objective are linked to the co-**manager (*NPT or IDFG*)** responsible for its implementation and completion.

Biological Objective: Ensure population levels of bull trout in the North Fork Clearwater River are above minimum viable population sizes which maintain adaptability and genetic diversity, and maintain a minimum breeding population of 150-300 individuals with >95 percent probability of persistence for ≥ 5 generations.

Assumptions: The construction and operation of Dworshak has significantly affected the distribution, abundance, and population viability of native populations of bull trout in Dworshak Reservoir and its tributaries. Native populations of bull trout in Dworshak and its tributaries can be enhanced by improvements in Dworshak operations. Habitat upstream is suitable for bull trout spawning and rearing.

Objective 1. Identify bull trout subpopulations and determine the status of the bull trout subpopulations in the North Fork Clearwater River.

Assumptions: A number of subpopulations are present in the North Fork Clearwater River. Effects of Dworshak on individual subpopulations may differ. Individual subpopulations can be identified and distinguished by spawning locality and behavior (homing/straying), or associated with life history attributes of the population.

Hypotheses:

Ho_1: Breeding subpopulations in the North Fork are not distinguished by spawning locality and behavior, or life history attributes of the subpopulation.

Ha_1: Breeding subpopulations in the North Fork Clearwater River are distinguishable by spawning locality and behavior, or life history attributes of the subpopulation.

Ho_2: All subpopulations are not viable, breeding population(s) of a minimum of 150-300 individuals.

Ha_2: All or some subpopulations are viable, breeding population(s) of a minimum of 150-300 individuals.

Task 1. Tag juvenile and adult bull trout in the reservoir and throughout the North Fork Clearwater River basin and observe movements and spawning behaviors. ***(NPT: Long term movements of juvenile and adult fish in upper basin. IDFG: Seasonal movement of adults in reservoir and upper basin).***

Product: Identify population interactions, population attributes, and define sub-populations in the basin.

Task 2. Observe temporal habitat use (i.e., spawning, early rearing, wintering) and critical migratory corridors. Define spawning, early rearing, and winter habitat characteristics. Define critical migratory corridors. ***(NPT: Upper basin. IDFG: Reservoir)*.**

Product: Identify critical bull trout habitat.

Task 3. Determine distribution of bull trout (presence/absence). Estimate subpopulation structure (YOY densities). Conduct redd counts and identify breeding individuals. Assess condition and growth ***(NPT)***.

Product: Status of subpopulation viability (measured as 150-300 breeding individuals per population throughout basin CBFWA 1997).

Objective 2. Identify how bull trout use and are affected by Dworshak Reservoir and operations.

Assumptions: Reservoir use by bull trout varies seasonally among age classes and subpopulations. Use of the reservoir by bull trout effects (either positive or negative) bull trout subpopulation(s) viability.

Hypothesis:

Ho: Reservoir habitat/use is not critical to bull trout. Use is not associated with subpopulation viability.

Ha: Reservoir habitat is critical to bull trout. Use (seasonal, age class or population use) is associated with either negative or positive changes in subpopulation viability.

Task 1. Track bull trout use of Reservoir. ***(IDFG)***

Product: Determine relative use of reservoir by subpopulations and its affect on subpopulation viability. Identify movement in and out of the reservoir -seasonal trends, use of migratory corridors.

Task 2. Monitor thermal barriers and relate to seasonal movements. ***(IDFG)***

Products: Identify seasonal (operational effects) on movement/use, blockage of migratory corridors.

Objective 3. Develop and implement strategies to protect and perpetuate bull trout populations in the North Fork Clearwater River drainage.

Assumptions: Bull trout populations are affected by the management and operation of Dworshak Reservoir. Specific management and operation strategies can be identified and implemented to protect and perpetuate bull trout subpopulations in the drainage.

Task 1. Coordinate with other sponsored projects in the North Fork Clearwater River drainage to determine risks to bull trout subpopulations. **(*IDFG and NPT*)**
Product: Assessment of risks to bull trout subpopulations in the drainage. Identification of management and operational strategies to minimize risks.

Task 2. Implement strategies identified in Task 1. **(*IDFG and NPT*)**.
Product: Protection and perpetuation of the bull trout subpopulations in the North Fork Clearwater River drainage.

Task 3. Monitor and evaluate strategies implemented. **(*IDFG and NPT*)**
Product: Evaluation of need for continuing protection and perpetuation of the bull trout subpopulations in the North Fork Clearwater River drainage.

f. Methods

Methods associated with each objective and task are linked to the co-manager responsible for its implementation and completion (see ***NPT or IDFG in objectives section above***). Methods presented in this sub-proposal address the tasks that will be completed by the Nez Perce Tribe. See the sub-contract submitted by Idaho Department of Fish and Game for additional methods.

Clearwater River. Objective 1. Identify bull trout subpopulations and determine the status of the bull trout subpopulations in the North Fork

Data Collection

The North Fork Clearwater River basin is 2,440 square miles, and has 3 major tributaries and numerous smaller tributaries. Most of the basin is characterized by inaccessible backcountry. The proposed project is a joint project with IDFG, and several tasks will be addressed by one or both proposals. We will attempt to address 3 questions with the data we collect: 1) what are the extent of movements of juvenile bull trout in the basin; 2) what is the critical habitat associated with bull trout in the North Fork Clearwater basin; and 3) what is the population structure and viability of bull trout in tributary streams in the basin. Movements of juvenile and adult bull trout will be detected using PIT tags. Critical habitat will be identified by describing the habitat associated with critical life stages of the bull trout, such as spawning and early rearing. Habitat will be compared between bull trout present and bull trout absent sites, and can also be compared between bull trout rearing versus spawning sites. Population structure and viability will be measured as redd counts and YOY densities at known spawning locations, age/length/weight condition factors at each site, and numbers of breeding individuals in each subpopulation.

A substantial amount of data exists for the North Fork Clearwater basin from fisheries activities conducted in the reservoir and upper tributaries by NPT, USFS, and IDFG. We will assemble these data to determine streams where bull trout have been observed, and identify population sizes and densities. Fifty meter sites will be snorkeled every 400m along all known bull trout streams from the mouth to the upper extent of fish

distribution. Streams greater than 4m wide will be snorkeled by multiple personnel progressing upstream in a line (Thurow 1994). The size and location (distance from bank, height in water column, habitat type, distance to cover) of each bull trout will be noted during snorkeling. After snorkeling the site, bull trout greater than 100mm will be collected using an aquarium net. Length, weight, and scale samples will be taken from each bull trout. Passive integrated transponder (PIT) tags will be inserted into trout greater than 120mm. Trout 120-150mm will have the PIT tag inserted into the abdominal cavity; trout >150mm will have the PIT tag inserted into the dorsal musculature alongside of the dorsal fin (D. Buchanan, ODFW, pers. comm).

Habitat characteristics will be collected after each snorkel. The location of each site will be marked on a topographic map. Five transects are measured at 10m intervals over the site. Habitat type, width, bank full width, depth, sediment size, and cobble embeddedness (Platts et al. 1983) are measured at each transect. Gradient, map elevation, Rosgen channel type (Rosgen 1993), and proportion of cover are measured over the site. Depths will be measured at three points across each transect. Ocular cobble embeddedness measurements will be calibrated with actual measurements of 50 cobbles from each site according to the Burns Method (Burns and Edwards 1985). Maximum pool depth and pool tail depth will be measured for each pool habitat type identified in the site. Temperatures will be measured with a thermometer in the water column and at the sediment in all habitat units where bull trout are observed. Side channel habitat will be snorkeled at all sites, and will be treated similar to main channel habitat.

Redd counts will be conducted for known spawning sites. One-pass redd counts are too variable to be useful for population monitoring (D. Buchanan pers. comm). Therefore, redd counts will be conducted continually during the spawning period, and bull trout will be detected on the redds. Each redd will be flagged for further reference. Duration of spawning activity at each redd site will be recorded, as well as number and size estimate of bull trout displaying spawning behavior. Ground water upwelling will be measured using a piezometer inserted several cm into the gravel to measure hydraulic head (Freeze and Cherry 1979). Temperature will also be used as an indicator of groundwater upwelling by measuring subsurface and water column temperature differences (Sorensen et al. 1996). YOY densities will be estimated by snorkeling the following summer in areas where redds were observed. Spawning sites will be monitored consecutive or alternate years depending on access and availability of personnel. Redd counts and YOY density estimates will be evaluated for their effectiveness as monitoring methods.

Data Analysis

Scales will be pressed into acetate strips, and number of annuli will be counted (Jearld 1983). Otolith samples will be collected from incidental mortalities to compare to the ages derived from the scales (Jearld 1983). Trout densities will be calculated using the number of trout by age class standardized by surface area of the site. Habitat variables collected in transects will be averaged over the site. Mean and standard deviations will be calculated for all habitat variables. Variables will also be checked for normality and transformations. Linear regression will be used to develop equations that will predict actual embeddedness from ocular estimates made by each observer. The

calculated linear regression will be used to adjust ocular embeddedness estimates for each observer.

Habitat data will be modeled by fish species and density using principal components analysis, factor analysis, and/or discriminant function analysis. The different statistical analyses will be evaluated for the data meeting the necessary assumptions.

Objective 2. Identify how Dworshak Reservoir and operations affect bull trout.

See IDFG proposal

Objective 3. Develop and implement strategies to protect and perpetuate bull trout populations in the North Fork Clearwater River.

We will work with the federal land managers (U.S. Forest Service) and the dam operators (U.S. Army Corps of Engineers) to develop risks to bull trout in the drainage. We will develop strategies to address those risks and devise a plan to implement those strategies.

g. Facilities and equipment

The NPT will provide office space, storage, and shared office equipment (fax, photocopier, internet access, etc) for the project in the Orofino Field Office. The location of the Orofino Field Office reduces travel time to the field sites. The project will have acces to 4-wheeler, trailer, backpack electroshocker, and computers. A GSA 4X4 truck will be rented through GSA. The truck and 4-wheeler are used for remote access.

h. Budget

The majority of the proposed budget is salaries, benefits, indirect, and operational costs (rent, utilities, etc). The project has two full-time biologists: a project leader and a fisheries biologist. Part-time support personnel include a secretary and supervisory biologist whose salaries are shared among several projects. Other costs include vehicle rental for transportation to the field, travel and per diem to meetings (BPA annual presentations, cooperative meetings, Columbia Basin issues, etc). Also included are costs of supplies needed to snorkel the rivers and sample fish, and two new scanners are needed to read the new PIT tags required in 2000.

Section 9. Key personnel

Dana Weigel

Project Leader, Nez Perce Tribe Fisheries
Orofino Field Office, 3404 Hwy 12, Orofino, ID 83544

EDUCATION

M.S. Fisheries, University of Minnesota 1994
B.S. Aquatic Environments, Allegheny College 1991

RESEARCH EXPERIENCE AND PUBLICATIONS

Project Leader, Nez Perce Tribe, Orofino, ID, Sept 1996 – present.

Project: Genetic inventory of westslope cutthroat trout in the North Fork Clearwater basin.

Reports: Weigel, D.E. 1997. The genetic inventory of westslope cutthroat trout in the NF Clearwater basin, Idaho. Annual Report prepared for the Bonneville Power Administration. Contract No. 95BI61768, Project No. 9501600. 13pp.

Weigel, D.E. and S. Cross. 1998. The genetic inventory of westslope cutthroat trout in the NF Clearwater basin, Idaho. Annual report prepared for the Bonneville Power Administration. Contract No. 97AM30423, Project No. 9501600.

Research Assistant, University of Minnesota, Department of Fisheries and Wildlife, St. Paul MN, Sept 1991 – March 1994

Thesis Title: Longitudinal distribution of brook, brown, and rainbow trout in a midwestern stream cannot be explained by habitat variables, submitted Transactions of American Fisheries Society 1997

Co-Author: Sorensen, P.W., T.E. Essington, J. Cardwell, and D.E. Weigel. 1995. Hybridization and spawning behavior of brook and brown trout in a small stream. Canadian Journal of Fisheries and Aquatic Sciences. 52:1958-1965.

TECHNICAL EXPERIENCE

Fisheries Biologist, Clearwater Biostudies Inc., Canby, OR, June –Sept 1996.

Project: Steam surveys under contract with the USFS Clearwater and Nez Perce National Forests

Fisheries Biologist, University of Idaho, Cooperative Fisheries Research Unit, Moscow, ID, April – June 1996.

Project: Radiotelemetry of adult chinook samlon at Ice Harbor Dam

Fisheries Biologist, M&M Environmental Enterprises, Boise, ID, June-Dec 1995.

Project: Stream surveys under contract with the USFS Payette National Forest

Fisheries Consultant, Vermont Natural Resource Council, Montpelier, VT, April – June 1995

Project: Prepare expert testimony evaluating FERC dam relicensing regulation, and evaluate the flow regulation studies and proposed fish passage facilities

Fisheries Biologist, USFS Intermountain Research Station, Boise, ID, Aug –Oct 1994.

Project: Monitoring the movements and genetic exchange of resident and migratory bull trout

Fisheries Biologist, National Biological Survey, Cook WA, April – July 1994

Project: Monitoring the movement of chinook and steelhead smolts through reservoirs and dams on the Snake and Columbia Rivers using radiotelemetry and hydroacoustics.

Research Assistant, Rocky Mountain Biological Lab, Gothic, CO, June-Sept 1991.

Project: Evaluating the costs and benefits of paedomorphosis versus metamorphosis in tiger salamanders and identifying the species composition of invertebrates in high elevation ponds.

TRAINING

University of Idaho, Applications of Multivariate Statistical Methods 1997.
USFWS, Fish Genetics, 1997.

JOB DUTIES

Literature reviews, report writing, experimental design, data analysis, computer modeling, speaking to peer and local interest groups, budget planning and management, writing proposals, administer contract and subcontract, personnel management, planning logistics, provide scientific advice to the agency, coordinate activities with other agencies and projects

Section 10. Information/technology transfer

Data collected by NPT and IDFG will be included into a common database annually. Although data collection, analysis, and some interpretation of the data will be done separately, the project has been designed in coordination. Data collected by both managers will be needed to fully assess impacts to bull trout populations. Key personnel from each project will maintain a continuing dialog. Annual data reviews will be conducted and used to by co-managers to revise study plans to insure project objectives are met.

The information collected will also be presented in quarterly and annual reports to the funding agency. Overall significant findings will be submitted for publication in appropriate refereed professional journals. The principal investigator will present findings annually to fishery agencies, professional groups or as requested.

Congratulations!