PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project	
Evaluate bull trout movements in the Tucannon and Lower Snake rivers.	
BPA project number	**20036**
Contract renewal date (mm/yyyy)	
Multiple actions? (indicate Yes or No)	
Business name of agency, institution or organization requesting funding	
U.S. Fish and Wildlife Service	
Business acronym (if appropriate)	**USFWS-IFRO**
Proposal contact person or principal investigator:	
Name	**Micheal P. Faler**
Mailing address	**P.O. Box 18**
City, ST Zip	**Ahsahka, ID 83520**
Phone	**(208) 476-7242**
Fax	**(208) 476-7228**
Email address	**micheal_faler@fws.gov**
NPPC Program Measure Number(s) which this project addresses	
10.1A.1, 10.5A	
FWS/NMFS Biological Opinion Number(s) which this project addresses	
USFWS Bull Trout Biop, Hydropower Operations (in prep.)	
Other planning document references	
USFWS Bull Trout Recovery Plan (in prep.)	
Short description	
Determine distribution of migratory bull trout in the Tucannon and Lower Snake rivers, and identify passage limitations (if any) resulting from the hydropower system. Establish metapopulation boundary for Tucannon River bull trout.	
Target species	
Bull Trout (*Salvelinus confluentus*)	

Section 2. Sorting and evaluation

Subbasin
Lower Snake Mainstem, Tucannon

Evaluation Process Sort

CBFWA caucus	CBFWA eval. process	ISRP project type
X one or more caucus	If your project fits either of	X one or more categories

		these processes, X one or both			
	Anadromous fish	X	Multi-year (milestone-based evaluation)		Watershed councils/model watersheds
X	Resident Fish		Watershed project eval.		Information dissemination
	Wildlife				Operation & maintenance
					New construction
				X	Research & monitoring
					Implementation & mgmt
					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
	N/A	

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
	N/A	

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Determine the spatial distribution of adult migratory bull trout in the Lower Snake River.	a	Capture adult bull trout as they stage for migration in or near the mouth of the Tucannon River.
		b	Surgically implant radio tags in 20 captured bull trout of appropriate size.
		c	Monitor movements of radio-tagged bull trout in the Snake River bi-weekly between the months of November and May (14 observations/fish/year).
		d	Compile bull trout observation data, and delineate river reach distribution based on upstream and downstream limits of observed movements.
2	Determine bull trout use and passage efficiency in fishways at Lower Snake River dams.	a	Coordinate with University of Idaho Cooperative Fishery Research Unit to activate and/or re-establish fixed data logging sites at the fishways in Lower Monumental and Little Goose dams.
		b	Operate and download data weekly at fixed telemetry sites from November through May(28 downloads/site/year).
		c	Evaluate data to determine bull trout use of the fishways.
		d	Calculate passage rates associated with bull trout that enter adult fishways at the dams.
		e	Compare bull trout passage rates to rates observed from anadromous salmonids at the Snake River dams.
3	Estimate frequency of bull trout fall back at Lower Snake River dams.	a	Plot movements of individual radio-tagged fish to determine timing and frequency of fall back through Snake River dams.
4	Determine if bull trout losses result from movements out of Lower Monumental Pool.	a	Evaluate movement plots of individual radio tagged fish to determine if those individuals that leave Lower Monumental Pool return the following spring.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	3/2000	5/2003	Delineate spatial distribution	May of 2001, 2002, and 2003	70
2	9/2000	5/2003	Determine passage efficiency in fishways	May of 2001, 2002, and 2003	20
3	1/2001	5/2003	Estimate fall back through dams	May of 2001, 2002, and 2003	5
4	5/2001	5/2003	Determine losses to production	May of 2001, 2002, and 2003	5
				Total	100

Schedule constraints
USFWS Section 10 permit authorizing "take" will be required. Preliminary project support has been obtained from Steve Duke, Bull Trout Recovery Team Leader, USFWS-Snake River Basin Office, Boise, Idaho.
Completion date
FY 2003

Section 5. Budget

FY99 project budget (BPA obligated):	$ N/A-New Proposal

FY2000 budget by line item

Item	Note	% of total	FY2000 ($)
Personnel	0.5 FTE GS-12 Biologist, 0.4 FTE GS-7 Biologist	37.4	38,500
Fringe benefits		9.5	9,800
Supplies, materials, non-expendable property	field gear (boots, waders, etc.) radio tags(20), antennae cables, gill nets, fyke net.	8.3	8,500
Operations & maintenance	equipment repairs, vehicle rental, gas	8.6	9,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)			0
NEPA costs			0
Construction-related support			0
PIT tags	# of tags:		0
Travel	coordination meetings, travel for	4.5	4,500

	sampling/fish collection		
Indirect costs	USFWS Overhead @ 22% for new projects	18.0	20,064
Subcontractor	Washington Department of Fish and Wildlife, Dayton Lab - Implementation of Objective 2. (62 days salary compensation @ $200/ day)	5.5	12,400
	Nez Perce Tribe - Flights for aerial radio-tracking. 14 flights @ $540/flight, 56 hours salary compensation @ $15/hour	8.2	8,400
Other			
		TOTAL BPA REQUESTED BUDGET	111,164

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
N/A			
		Total project cost (including BPA portion)	

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	113,130	113,130		

Section 6. References

Watershed?	Reference
	Bjornn, T.C. and C.A. Peery. 1992. A review of Literature Related to Movements of Adult Salmon and Steelhead Past Dams and Through Reservoirs in the Lower Snake River. U.S. Army Corps of Engineers Technical Report 92-1. Walla Walla District.
	Buchanan, D., M Hanson, and R.M. Hooten. 1997. 1996 Status of Oregon's Bull Trout. Oregon Department of Fish and Wildlife, Portland, Oregon.
	Corps of Engineers. 1997. 1997 Annual Fish Passage Report, Columbia and Snake Rivers for Salmon, Steelhead and Shad. North Pacific Division, U.S. Army Corps of Engineers, Portland and Walla Walla Districts.
	Elle, S. 1995. Federal Aid to Fish Restoration. Job Performance Report. Grant F-73-R17. Project 6, Bull Trout Investigations. Subproject 1, Rapid River bull

	trout movement and mortality studies, and Subproject 2, Bull Trout aging studies. IDFG 95-33. Idaho Fish and Game. Boise, Idaho.
	Faler, M.P., L.M. Miller, and K.I. Welke. 1988. Effects of Variation in Flow on Distributions of Northern Squawfish in the Columbia River below McNary Dam. North American Journal of Fisheries Management 8:30-35.
	Faler, M.P. 1995. An Evaluation using a Mark-Recapture Population Estimator as a Monitoring Tool for an Adfluvial Bull Trout Population. Aqua-Talk, USDA-Forest Service R-6 Fish Habitat Relationship Technical Bulletin, Number 9, August 1995.
	Faler, M.P. and T. B. Bair. 1992. Migration and Distribution of Adfluvial Bull Trout in Swift Reservoir, North Fork Lewis River and Tributaries. Gifford Pinchot National Forest, Wind River Ranger District, Unpublished Report.
	Federal Register. 1998. Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout. Vol. 63, No. 111. FR Doc. 98-15319. June 10, 1998.
	Kleist, T. (Washington Department of Wildlife) 1993. Memorandum to Eric Anderson (WDW) sumarizing fish passage at Snake River dams.
	Rieman, B.E. and J.D. McIntyre. 1993. Demographic and Habitat Requirements for Conservation of Bull Trout. USDA Forest Service, Intermountain Research Station. General Technical Report INT-302.
	Theisfeld, S.L., A.M. Stuart, D.E. Ratliff, and B.D. Lampman. 1996. Migration Patterns of Adult Bull Trout in the Metolius River and Lake Billy Chinook, Oregon. Oregon Department of Fish and Wildlife Information Report 96-1. Portland, Oregon.

PART II - NARRATIVE

Section 7. Abstract

The overall goal of the project is to determine if the Hydropower System on the Lower Snake River has affected the capability of Tucannon River bull trout to freely interact with subgroups such as those occurring in the Grande Ronde or Walla Walla rivers. The project will help meet measures 10.1A.1 and 10.5A in the 1994 Fish and Wildlife Program, and provide useful information for bull trout recovery planning and hydrosystem effects determinations. We will use radio-telemetry to monitor the movements of adult bull trout if/when they leave the Tucannon subbasin and move into the main stem Snake River in the winter and spring, 2000 - 2003. Adult bull trout will be captured at the Tucannon Hatchery weir in the spring, and surgically implanted with radio-transmitters in years 2000 - 2002. By using long-term tags and surgical implants in spring, we allow ample time for surgical recovery to minimize effects of those activities on fish movements during our winter target period. We will use fixed station data loggers to evaluate passage efficiency in fishways at Snake River dams, and to determine if a proportion of the subpopulation becomes lost to production if fish move out of Lower Monumental Pool.

Tracking from boat, shore, and/or aircraft will also be used to monitor distribution in the reservoirs.

Section 8. Project description

a. Technical and/or scientific background

The recent listing of the Columbia River Distinct Population Segment of bull trout identified one of the major threats to the species as the lack of connectivity between between subgroups, or the inability for metapopulations to interact with one another for genetic exchange or refounding of unoccupied habitats (Federal Register, 1998). A migratory subgroup in the Tucannon River apparently utilize the main stem Snake River for adult rearing on a seasonal basis. Their occurrance in the hydropower system has been verified by a few incidental observations during sampling in Lower Monumental Pool (Buchanan et al. 1997 citing Ward), and in the adult passage facilities at Lower Monumental and Little Goose dams in the early 1990s (Kleist, in litt. 1993). Based on fish counting schedules outlined in COE (1997), no attempts at adult fish enumerations are made at the Lower Monumental or Little Goose fish counting windows from Nov. 1 through March 31. Unfortunately, this scheduled abandonment of fish counting activities coincides with adult bull trout movements into larger mainstem systems for adult rearing and foraging as indicated in other Columbia Basin subpopulations (Elle 1995; Faler and Bair 1992; Martin et al. 1992; Theisfeld et al. 1996; Underwood et al. 1995). As a result, it is unknown if the existing fishways at the lower Snake River dams are suitable for bull trout passage, or if migratory fish originating from the Tucannon River attempt to pass these facilites on a regular basis.

The potential for bull trout movements throughout the migratory corridor is high, but from the standpoint of future delisting, the establishment of workable, verified “recovery zones” or interconnected metapopulations will be important to a successful recovery program. Rieman and McIntyre (1993) describe the metapopulation concept and the role of core management areas to bull trout conservation. In essence, they indicate that extinction risk decreases with increasing numbers of interconnected subpopulations. In order for this concept to be fulfilled, there must first be established local subgroups that are segregated from one another by a given means such as fragmented spawning and rearing areas. Second, these local subgroups must have the physical capability to intermingle or move among or between each other without physical limitations in at least one age group or life history phase. Finally, this mixing and associated straying must actually occur, and do so frequently enough to promote genetic exchange and successful refounding of unoccupied or recovering habitats. With these concepts in mind, the primary questions to be answered are: At what geographic scale do we apply a metapopulation boundary, or “recovery area” associated with bull trout in the Tucannon River? Are the various subgroups in the Tucannon River functioning as a metapopulation within the subbasin, or is there sufficient movement and mixing within the migratory corridor to warrant considering a much larger geographic area that my range into the Walla Walla or Clearwater, etc. subbasins? Does the existing hydropower system on the Lower Snake River limit the capabilities of Tucannon River bull trout to intermix with other subgroups to form a metapopulation at a much larger scale?

b. Rationale and significance to Regional Programs

Columbia River Basin Fish and Wildlife Program

10.1A.1--"Complete assessments of resident fish losses and gains related to construction and operation of each hydropower facility..." The proposed study would provide data associated with adult bull trout movements through the hydropower system, and "fall back" if it occurs. These data could help initially quantify bull trout losses associated with the Lower Snake River dams.

10.5A--"Study and Evaluate Bull Trout Populations" The proposed study would help define the needs of adult rearing bull trout in the Lower Snake River, and determine limitations to passage (if any) resulting from the hydropower system.

USFWS Biological Opinion on Hydrosystem Effects on Bull Trout (expected completion date in summer, 1999)

Specific issues to be adressed in the Hydrosystem BiOp have not yet been identified, but certainly one of these will be the movements of migratory bull trout in the main stem migratory corridor, and associated passage requirements at the dams. Our study will evaluate the movements of adult bull trout as they enter Lower Monumental Pool from the Tucannon River. The data will help determine if these fish attempt to pass the dams into other reservoirs, and if so, if the passage facilities at the dams impede free movement of bull trout into other habitats or back to the Tucannon River to spawn. If bull trout commonly move upstream through the fishways, they must be able to "fall back" freely without harm, or these fish may be lost to production and result in "take".

USFWS Bull Trout Recovery Plan (final scheduled for January, 2001)

The Recovery Plan associated with the Columbia River Distinct Population Segment of bull trout is in the process of development. The Recovery Oversight Team has been discussing the concept of "recovery zones" which would essentially mimic functional metapopulation boundaries, or areas with the potential for connectivity that may form a metapopulation. Currently, there is no data to substantiate or reject a hypothesis suggesting that bull trout move freely through the fishways at main stem dams. The results of our study would help define metapopulation boundaries associated with the Tucannon River bull trout subgroup, and establish a methodology that may be applied to other migratory subgroups that overwinter in the main stem. We may also determine if fishway designs at the Snake River dams are suitable for passing bull trout through the facilities, and if so, these designs could be used on other dams where bull trout passage is needed for recovery purposes.

c. Relationships to other projects

This study will provide a critical tie to on-going bull trout recovery efforts in the Pacific Northwest. The resulting distributional data will assist the recovery team with an example of a

potentially unimpeded migratory subgroup, and how that subgroup may interact with others under the concept of metapopulation theory. Passage efficiency results may prove useful in designing fishways at dams requiring passage under FERC reliscensing efforts, or in modifying existing fishways to improve/provide bull trout passage for recovery efforts.

An added benefit to the project would be an opportunity to track the these in the Tucannon River during the summer and fall to better delineate bull trout movements and spawning areas in that subbasin.

d. Project history (for ongoing projects)

N/A (This proposal is for a new project)

e. Proposal objectives

Our objectives are to:

1. Determine the spatial distribution, migration timing, and movements of adult migratory bull trout in the Lower Tucannon and Snake rivers.

2. Determine bull trout use and passage efficiency in fishways at Lower Snake River dams.

3. Estimate frequency of bull trout fall back at Lower Snake River dams.

4. Determine if bull trout losses result from movements out of Lower Monumental Pool.

The proposed study will specifically test the following hypotheses:

Obj. 1. H_o-Migratory bull trout from the Tucannon River range widely in the Lower Snake River.

H_a-Migratory bull trout from the Tucannon River overwinter specifically in the Lower Tucannon River and Lower Monumental Pool.

Obj. 2. H_o-Adult bull trout overwintering in the Snake River move through the fishways at the Lower Snake River dams.

H_a-Adult bull trout overwintering in the Snake River have difficulty negotiating fishways at the Lower Snake River dams.

Obj. 3. H_o-Adult bull trout overwintering in the Snake River fall back through the dams into downstream reservoirs.

H_a-Adult bull trout overwintering in the Snake River do not fall back through the

dams into reservoirs downstream.

Obj. 4. H_o-Adult bull trout that fall back through Lower Monumental Dam or pass upstream through the Little Goose fishway freely return to the Tucannon River the following spring to spawn.

H_a-Adult bull trout that fall back through Lower Monumental Dam or pass upstream through the Little Goose fishway do not return to the Tucannon River, and are lost to production.

f. Methods

Critical Assumptions: The primary assumption associated with the study is that the movements of radio-tagged bull trout are not different from the movements of other bull trout in the subgroup. This assumption is critical to the project as a whole. Objectives 2 and 4 have critical assumptions, in part, associated with each of those objectives. In order to determine passage efficiency in Objective 2, we must assume that portion of our radio-tagged bull trout will at least attempt to pass through a fish ladder. Likewise, in order to estimate the extent of losses in Objective 4, there must be some movement (upstream or downstream) of radio-tagged bull trout out of Lower Monumental Pool.

Sampling: The approach of the study is to use radio-telemetry to monitor the movements of adult bull trout as they emigrate to the Snake River to rear in the winter. Twenty adult bull trout would be captured at the Tucannon Hatchery wier in spring of years 2000, 2001, and 2002. Each captured bull trout will be measured, weighed, marked with a floy tag, and released above the wier. Those fish of appropriate size ($\geq$ 50 times transmitter weight in air) will be surgically implanted with 360 day life expectancy radio-tags (Objectives 1-4). Surgical procedures will follow those used by Faler et al. (1988) and Faler and Bair (1992). Tagging activities will occur in the spring because: 1) spring is when other migratory populations are most susceptible to capture (Theisfeld et al. 1996; Faler and Bair 1992), 2) bull trout gonadal development is in its early stages which will allow sufficient abdominal space for the tag, and 3) migratory delays resulting from surgical trauma as described by Faler (1995) will be long past by our winter target period.

Radio-tags for this study will be obtained from Lotek Engineering. Currently, there is a coded tag available that weighs 8.9 g in air, is DSP compatible, and has a guaranteed life expectancy of 395 days. With this transmitter, we could safely radio tag bull trout as small as 445 g, or approximately 1 lb. Specific frequencies and codes to be used will be coordinated through the University of Idaho so that existing fixed reciever stations in the Snake River will have the capability of logging radio-tagged bull trout as they pass those sites. Critical operating sites for this study will include 4 fixed stations at the upstream and downstream ends of the adult fishways at Lower Monumental and Little Goose dams. These fixed site data loggers will be in operation throughout the winter and spring (2000 - 2003) to record bull trout movements through fish ladders at the dams (Objective 2). In addition, WDFW will operate a fixed site near the mouth of the Tucannon River, and this site will identify timing of movements out of the Tucannon subbasin and into the main stem Snake River. Radio-tagged fish locations will also be monitored biweekly

by boat, shore, or aircraft between November and May (Objective 1). Individual fish locations will be recorded by river kilometer, and in relation to distance and direction to known landmarks.

Analysis: Winter distribution of bull trout will be delineated by the furthermost upstream and downstream fish locations observed in the study period. Distribution will be described as a river reach encompassed by river kilometer identifiers at the upper and lower limits (Objective 1).

Data retrieved from fixed station data loggers will be examined to determine if bull trout move through the fish ladders at either dam. If so, passage rates will be calculated from the time of entry to time of exiting. If sufficient numbers of radio tagged fish move through the fishways, the variability of the data set will be examined to determine generalities in those rates and data outliers, if they exist. Bull trout passage rates will be compared to salmon and steelhead passage rates already determined at those dams by Bjornn and Peery (1992) to detect differences, if any, in passage rates between species (Objective 2).

Bull trout that fall back through spill gates, navigation locks, or turbine intakes will not likely be detected at the fishway fixed stations. We will use distributional data from boat, shore or aircraft locations to determine the occurance and frequency of fall back through the dams (Objective 3).

Data sets from individual bull trout that move out of Lower Monumental Pool will be examined to detect the return of those fish to the Tucannon River the following spring. A loss determination will be inferred if those fish do not pass back through a dam, and into Lower Monumental Pool by May, the following year (Objective 4).

Expected Results: We expect to describe the movements of adult migratory bull trout in the Lower Snake River and delineate their winter distribution in the hydropower system. We also expect to identify any passage limititations that may be encountered by adult migratory bull trout as they over-winter in the Lower Snake River reservoirs, and provide data to begin estimating losses of this species associated with the hydropower system.

Factors that may limit project success: The most critical factor that may affect success of this project is the capability to capture our target number of bull trout when water temperatures are appropriate for surgical implants of radio tags. Based on numbers and sizes of migratory bull trout annually observed at the Tucannon weir, the capture of 20 fish $\geq$ 1 lb. in weight should be easily achievable, but we must capture 20 early in the run (May and early June) to minimize adverse effects and infection associated with increasing water temperatures.

The bull trout sport harvest season for the Tucannon River is scheduled for closure starting in 1999, so fears of losing tagged fish to anglers will be substantially lessened. There is always the possibility of losing tagged fish to incidental mortality associated with catch and release, or illegal harvest, but we do not expect these factors to be a substantial source of project limitations.

g. Facilities and equipment

The Idaho Fishery Resource Office is currently a well equipped field office for conducting fisheries work in the Snake River Basin. We have some of our own radio-tracking equipment that

would be compatible with this project, well trained biologists in the use of the equipment, well equipped boats and vehicles, professional administrative support, and a wide array of personal computers for data storage, retrieval, and analysis. We would need to procure radio-tags from Lotek Engineering to conduct the proposed study.

The use of telemetry recievers and peripheral equipment associated with the fixed data logger sites will be coordinated through the University of Idaho Cooperative Fishery Research Unit. Initial contact has been made with Michelle Feeley, and coordination associated with reciever and site needs has begun.

We intend to subcontract the Nez Perce Tribe Fisheries Department to conduct all aerial telemetry surveys associated with the project using their equipment. Initial contact was made with Steve Rocklage (NPT Biologist) to verify their participation and develop cost estimates for their work.

We also intend to subcontract WDFW, Dayton Lab, to download data associated with the fixed telemetry sites. They currently have data storage, retrieval, and manipulation capabilities that will not require the procurement of new equipment for this project. Initial contact and coordination has been made with Glen Mendel.

h. Budget

The requested budget for FY 2000 is $102,846. This cost is based on 22% USFWS overhead associated with new proposals. Increases in outyear budgets for FY 2001 and 2002 are based on an overhead increase to 34.2%. Personnel costs were adjusted upward from current rates to reflect expected cost of living increases. Travel costs for this project will be moderate, with most of it associated with early spring collection of bull trout for radio-tagging.

Section 9. Key personnel

Principal Investigator: Micheal P. Faler, Supervisory Fishery Biologist, GS-12
Project Duties: Coordinate and oversee field activities, perform surgical implants of radio-tags, analyze and report data and findings.

Qualifications: Eighteen years experience in fishery biology (research and management), with fifteen of those in the Columbia River Basin. Six years monitoring bull trout populations in the Lewis River, WA, and four of those conducting a bull trout radio-tracking study.

*see attached resume

Section 10. Information/technology transfer

Project results will be distributed annually through annual progress reports. A final report compiling all three years of data will be produced upon project completion. Opportunities will be explored to present project findings at professional society meetings and other pertinent symposia. Opportunities will also be explored to submit widely applicable findings to peer reviewed journals

for publication.

Congratulations!

Micheal P. Faler

EDUCATION

Master of Science—SOUTH DAKOTA STATE UNIVERSITY **1988**
Major: Fisheries Sciences BROOKINGS, SOUTH DAKOTA
Bachelor of Science—WESTERN KENTUCKY UNIVERSITY **1981**
Major: Biology *Minor:* Chemistry BOWLING GREEN, KENTUCKY

EMPLOYMENT

Supervisory Fishery Biologist **1996-Present**
U.S. FISH AND WILDLIFE SERVICE AHSAHKA, IDAHO

First line supervisor of two biologists and one biological technician. Assist with redd surveys, juvenile enumeration, and spawning and rearing activities associated with spring chinook salmon studies in the Clearwater River, Idaho. Participate in the technical advisory team for bull trout recovery the Clearwater Basin as established for implementation of Idaho's (Governor Batt's) bull trout conservation plan. Primary investigator in the preparation of the status, distribution, and threat analysis of bull trout in the Snake River Basin, as part of the 1997 ESA listing team and development of the final rule.

Fishery Biologist **1994-1996**
U.S. FOREST SERVICE VANCOUVER, WASHINGTON

Provided program oversight and development to habitat inventory, evaluation, and restoration projects. Provided technical assistance to biologists in the development of smolt production estimates. Initiated and coordinated steelhead recovery efforts in the Wind River, Washington, and was primary investigator of a bull trout radio-tracking study in the Lewis River, Washington.

Fishery Biologist **1988-1994**
U.S. FOREST SERVICE CARSON, WASHINGTON

South Zone program manager for fisheries and hydrology resources on the Gifford Pinchot National Forest. I directly supervised the activities of 2 biologists, 1 hydrologist, and 1 technician. Worked cooperatively with other agencies and private parties in developing habitat evaluation and restoration projects for fisheries and aquatic resources. Participated in and supervised participation in several interdisciplinary teams established to prepare NEPA documents for evaluating the environmental effects of proposed actions on Federal Lands.

Fishery Biologist **1986-1988**
U.S. FISH AND WILDLIFE SERVICE VANCOUVER, WASHINGTON

Supervised two biologists and a laborer in an off-site pen rearing program of upriver bright fall chinook salmon in Columbia River backwaters.

Fishery Biologist **1983-1986**
U.S. FISH AND WILDLIFE SERVICE-RESEARCH COOK, WASHINGTON

Primary investigator in radio-tracking study of walleye and northern squawfish in the John Day Pool. The project was part of a predation study on juvenile salmonids, and was used to help determine seasonal "closure" of population segments for the enumeration of predators in the reservoir and tailrace.

EXPERTISE—I have worked over fifteen years as both a research and management fishery biologist in the Columbia River Basin. The primary emphasis has been in chinook salmon, steelhead, and bull trout migratory behavior (adult and juvenile), habitat use, and limiting factors. I have broad knowledge and expertise in data management and writing skills, in addition to certifications in open water SCUBA diving and electrofishing through the Fisheries Academy.

SELECTED REPORTS

Faler, M.P. 1995. An Evaluation Using a Mark-Recapture Population Estimator as a Monitoring Tool for an Adfluvial Bull Trout Population. Aqua-Talk (R-6 Fish Habitat Relationship Technical Bulletin), Number 9, August, 1995.

Faler, M.P. and T.B. Bair. 1991. Migration and Distribution of Adfluvial Bull Trout in Swift Reservoir, North Fork Lewis River and Tributaries. 1991 Challenge Cost Share Report, USDA-Forest Service, Carson, WA.

Faler, M.P., L.M. Miller and K.I. Welke. 1988. Effects of Variation in Flow on Distributions of Northern Sqauwfish in the Columbia River below McNary Dam. North American Journal of Fisheries Management, 8:30-35, 1988.