

**Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal**

Section 1. General administrative information

Smolt Monitoring At Federal Dams

Bonneville project number, if an ongoing project 8401400

Business name of agency, institution or organization requesting funding
National Marine Fisheries Service

Business acronym (if appropriate) NMFS

Proposal contact person or principal investigator:

Name Rick Martinson
Mailing Address 2325 River Road, Suite 4
City, ST Zip The Dalles, Oregon 97058
Phone 541-296-8989
Fax 541-296-8717
Email address rickdm@gorge.net

Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
Pacific States Marine Fisheries Commission	45 SE 82nd, suite 100	Gladstone, OR 97027-2522	Pam Kahut

NPPC Program Measure Number(s) which this project addresses.
5.9A.1

NMFS Biological Opinion Number(s) which this project addresses.
NMFS BO RPA Sec. 13a

Other planning document references.

Subbasin.
Columbia Basin

Short description.

Monitor migration of juvenile salmon and steelhead at Bonneville and John Day Dams.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction		Watershed
	Resident fish		O & M		Biodiversity/genetics
	Wildlife		Production		Population dynamics
	Oceans/estuaries		Research		Ecosystems
	Climate	X	Monitoring/eval.	X	Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.		Supplementation
			Enforcement		Wildlife habitat enhancement/restoration
			Acquisitions		

Other keywords.

gas bubble disease,

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
9403300	Fish Passage Center	data collection
9602100	Gas bubble disease Monitoring	data collection
8712700	Smolt Monitoring	data collection
9702400	Juvenile Salmonids in the Columbia River Basin	provide research fish
8902401	Evaluate Umatilla Basin Project	data collection

Section 4. Objectives, tasks and schedules**Objectives and tasks**

Obj 1,2,3	Objective	Task a,b,c	Task
1	Monitor juvenile salmonid passage at John Day Dam	a	Operate new bypass collection facility throughout the monitoring season
		b	Provide daily sample totals by species
		c	Provide daily total descaling and

			mortality information by species.
		d	Collect length and condition data for each species three times per week
		e	Conduct gas bubble disease monitoring exams
		f	Provide all external mark recovery information
		g	Provide FPC with daily river, powerhouse, and spill flows
		h	Conduct Quality Control tests weekly
2	Monitor Juvenile Salmon Passage at Bonneville Dam	a	Same tasks as were listed above for John Day Dam
3	Provide fiscal, personnel, and managerial support for monitoring activity.	a	Data analysis and verification of data entries
		b	Generate Weekly, Quarterly, and Annual reports
		c	Strategic planning, budgeting, work statement preparation, and contract renewal.
		d	Preparations for sampling season, e.g. planning, purchasing, hiring, and training.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	3/1998	11/1998	45.00%
2	3/1998	11/1998	38.00%
3	2/1998	1/1999	17.00%
			TOTAL 100.00%

Schedule constraints.

The new facility at John Day not being ready in time could delay start up of sampling at that site. Any mechanical failure of sampling equipment can delay sampling.

Completion date.

indefinite, due to "monitoring" nature of project.

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel	NMFS Employees	\$90,000
Fringe benefits	NMFS Staff, includes unemployment	\$20,000
Supplies, materials, non-expendable property		\$25,000
Operations & maintenance	Rents, Communications and Utilities	\$20,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		
PIT tags	# of tags:	
Travel	Includes all GSA vehicles (10K, travel3K)	\$13,000
Indirect costs	Includes NMFS and PSMFC overhead	\$95,000
Subcontracts	PSMFC personnel, maintenance, crane	\$405,000
Other		
TOTAL		\$668,000

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget	\$670,000	\$675,000	\$680,000	\$685,000
O&M as % of total	45.00%	45.00%	45.00%	45.00%

Section 6. Abstract

This project provides daily fish capture and condition data, as well as dam operations and river flow data real-time to the Fish Passage Center to improve the scientific information on which to base in-season flow and spill management decisions directed toward improving protection and passage conditions for juvenile salmon and steelhead in the lower Columbia river. This project is providing a historical time series of smolt monitoring information that contributes to a better understanding of the relationship between environmental conditions, smolt migration characteristics, smolt passage survival and adult production. Specifics on the yearly contributions of this project can be found in the reports referenced below.

Section 7. Project description

a. Technical and/or scientific background.

To reduce juvenile salmonid mortality associated with dam passage and migratory

delays by providing real time, species specific data used in spill management, flow augmentation, and research evaluation. Progress is measured by noting whether or not we are obtaining the necessary data. An evaluation of the effectiveness of downstream migration protection actions is contained in the annual reports of the FPC. The FPC reports analyze and synthesize the information from this project together with the information collected by all other SMP projects and other environmental information. Progress is measured by comparing the results of these reports over the years.

This project has been in place since 1984 and will continue indefinitely as part of the annual coordinated regional SMP. The project can undergo regional, technical peer review. Unique diel aspect of this project provides species specific fish behavior information regarding dam passage. Another advantage of hourly sampling is that there is virtually no delay to migrating smolts. Also, in 1995 PIT tag detections were useful in calculating survival estimates and since 1993 at John Day and 1995 at Bonneville, enabled us to collect fish specific condition information from PIT tagged sample fish.

b. Proposal objectives.

This objective of this project is to provide daily fish capture and condition data, as well as dam operations and river flow data, real-time, to the Fish Passage Center. These data improve the scientific information on which to base in-season flow and spill management decisions. These decisions are directed toward improving protection and passage conditions for juvenile salmon and steelhead in the lower Columbia river. This project is providing a historical time series of smolt monitoring information that contributes to a better understanding of the relationship between environmental conditions, smolt migration characteristics, smolt passage survival and adult production. Specifics on the yearly contributions of this project can be found in the reports referenced below.

Future objectives include full bypass PIT tag detection at John Day with the completion of the new sampler, scheduled for March of 1998. At Bonneville, a new sampling facility is planned that will provide full bypass PIT tag detection for both powerhouses, improving passage conditions and data collection.

c. Rationale and significance to Regional Programs.

The hypothesis of the program is that smolt migration travel time can be reduced by increasing flows through spill management and flow augmentation, resulting in greater smolt survival. The objective of this project, as part of the Smolt Monitoring Program, is to provide accurate and timely data to the FPC on which to base the decisions that attempt to prove the hypothesis. The ultimate goal of the program, to increase juvenile survival and consequently adult returns, is consistent with the goals of the FWP and the NMFS Biological Opinion.

d. Project history

This project was established to monitor mainstem fish passage by collecting and reporting real-time smolt monitoring data to the Fish Passage Center to improve scientific information with which to base in-season flow and spill management decisions in the Snake and Lower Columbia River. In the 1980s this NMFS project conducted the smolt monitoring at federal dams in the Snake and Columbia Rivers (i.e. Lower Granite, Lower Monumental, McNary, John Day, and Bonneville Dams). In the early 1990s the smolt monitoring at Snake River dams and McNary Dam was assumed by non-federal entities (i.e. mainly the states of Washington and Oregon) and this project continued the smolt monitoring at John Day, The Dalles (1989, 1990, and 1991) and Bonneville dams. John Day and Bonneville are unique in that they provide the only hourly dam passage (diel) information in the Smolt Monitoring Program.

Monitoring data is sent daily during the migration season to the Fish Passage Center for input into realtime in-season water management decisions. A series of quarterly and annual reports under the title "Monitoring of Downstream Salmon and Steelhead at Federal Hydroelectric Facilities" have and continue to be produced by this project. The BPA publication numbers for the Annual Report series follow: Annual Report 1984, November 1984; Annual Report 1985 DOE/BP-20733-1 May 1986; Annual Report 1986 DOE/BP-20733-2 March 1987; Annual Report 1987 DOE/BP-20733-3 May 1988; Annual Report 1988 DOE/BP-20733-4 May 1989; Annual Report 1989 DOE/BP-20733-5 February 1990; Annual Report 1990 DOE/BP-20733-6 March 1991; Annual Report 1991 DOE/BP-20733-7 April 1992; Annual Report 1992 DOE/BP-20733-8 May 1993; Annual Report 1993 DOE/BP-20733-9 April 1994; Annual Report 1995 DOE/BP 20733-10, December 1996, Annual Report 1996 DOE/BP 20733-11, (in press).

The following article was written using project data and co-authored by a biologist working in the SMP. "Seasonal and Diel Passage of Juvenile Salmonids at John Day Dam on the Columbia River" by D.A. Brege, R.F. Absolon, R.J. Graves., North American Journal of Fisheries Management.

Progress is measured by noting whether or not we are obtaining the necessary data.

An evaluation of the effectiveness of downstream migration protection actions is contained in the annual reports of the FPC. The FPC reports analyze and synthesize the information from this project together with the information collected by all other SMP projects and other environmental information. Progress is measured by comparing the results of these reports over the years.

This project has been in place since 1984 and will continue indefinitely as part of the annual coordinated regional SMP. The project can undergo regional, technical peer review. Unique diel aspect of this project provides species specific fish behavior information regarding dam passage. Another advantage of hourly sampling is that there is virtually no delay to migrating smolts. Also, in 1995 PIT tag detections were useful in calculating survival estimates and since 1993 at John Day and 1995 at Bonneville, enabled us to collect fish specific condition information from PIT tagged sample fish.

Data generated by this project has been and continues to be used to monitor and gauge the timing and magnitude of the smolt outmigration. This information enables managers to formulate System Operational Requests (SOR's) designed to maximize smolt survival by optimizing in river conditions. Smolt monitoring data is also used to calculate survival and travel time estimates used in formulating passage strategies, e.g. to transport or not. Especially useful in 1995 were the PIT tag detections which enabled researchers to calculate survival estimates and evaluate transportation studies, again affecting management decisions regarding flow management and the transportation program

Historic Obligations:

1984	\$271,848
1985	\$453,376
1986	\$562,413
1987	\$519,200
1988	\$428,000
1989	\$943,700
1990	\$697,900
1991	\$602,800
1992	\$1,652,700
1993	\$
1994	\$447,400
1995	\$700,000
1996	\$633,500
1997	\$644,300

e. Methods.

Objective 1 from Section 4.

At John Day Dam, a new sampling facility is scheduled to go on line in 1998. This facility directs the flow in the juvenile bypass channel into an elevated chute and through a dewatering structure where most of the water is removed. From the dewatering structure, the remaining water and fish travel down a transport flume to the secondary dewatering structure where the fish are further dewatered so they can be scanned for PIT tags and or diverted into the sample building for processing as part of the smolt monitoring sample.

Objective 2 from Section 4.

At Bonneville a wedge wire flume is lowered into the bypass channel and fish are diverted into a basket suspended at the end of the inclined screen. At the end of the sample period the basket is raised and the fish are processed. Between samples the basket is put back down in the sampling position but the flatplate PIT tag detector is positioned so that fish pass over it and into the downwell.

At both sites, as the data is collected it is recorded on data sheets for later entry into computer programs. At the end of the sample day the data is checked and transmitted to the Fish Passage Center. More sampling method details can be found in the most recent report from the list provided in the Project History section.

Critical assumptions include:

1. Behavior and survival of PIT tagged fish is no different than non-PIT tagged fish.
2. Higher river flows result in higher juvenile survival.
3. Samples collected are not different from the population at large. In recent years the target sample size has been reduced to minimize impacts due to handling.
4. The Gas Bubble Disease monitoring protocol produces results that are not different from the level of GBT symptoms in the population at large.
5. Anesthetization and handling of smolts does not negatively affect post examination behavior or survival, or at least is at acceptably low levels.
6. Descaling and injury not attributable to predators, occurred at the project as a result of passing through the juvenile bypass system.

Critical Constraints may include: 1) At Bonneville Dam, smolt passage from Spring Creek Fish Hatchery releases may exceed levels that can be safely sampled, shutting down sampling operations, 2) High debris loads can cause orifice, trash rack, and screen plugging, increasing damage to fish and resulting in sampling interruptions while debris is cleared.

f. Facilities and equipment.

The major facilities used for this project are the bypass system samplers at the respective dams. At John Day Dam a new facility was built and will be used to interrogate all guided outmigrants for PIT tags and to collect samples for smolt monitoring in 1998. All fish holding areas are covered and supplied with a continuous supply of fresh water. All necessary field equipment will be secured prior to sampling, including necessary or precautionary safety equipment. Vehicles, office space, computers, audio visual equipment, and other project necessities are adequate.

g. References.

Section 8. Relationships to other projects

1. The Dalles Dam Spillway Survival study, funded by the CoE, conducted by NMFS. This project recruits, trains and supervises the personnel that operate the collection equipment in the second powerhouse at Bonneville dam where the fish for this research are collected. Additionally, since the fish are processed in the PH2 lab where smolt condition samples for the SMP are collected and processed, much assistance was provided.

2. Gas Bubble Monitoring.

This project recruits and supervises the personnel that conduct the gas bubble exams for the gas bubble monitoring program.

3. Radio Tracking studies.

This project collects and holds fish at John Day and Bonneville Dams for various radio tracking studies.

Section 9. Key personnel

The Project Manager for this project is Rick D. Martinson. He averages 40 hours per week, year round and requires 1 FTE. The Project Manager is responsible for all human and fiscal resources, strategic planning, recruiting, budget preparation, project descriptions, purchasing, and performance monitoring. He has worked in the Smolt Monitoring Program since 1989, starting as a Biological Technician and advancing to Project Manager in 1996. A condensed resume follows.

RICK D. MARTINSON
420 E. 8TH ST.
The Dalles, Oregon 97058
(541) 298-4859

WORK EXPERIENCE EXPERIENCE

Project Leader, Smolt Monitoring Program

3/31/96- present

National Marine Fisheries Service, The Dalles, OR.

Responsible for the human and fiscal resources of the smolt monitoring project at John Day and Bonneville Dams. Duties include strategic planning, budget preparation, recruiting, training, report writing, data analysis, purchasing, contract renewal, interagency coordination, facility design review, and performance appraisal.

FISH BIOLOGIST, Smolt Monitoring Program **3/89 B 3/31/96**
National Marine Fisheries Service, Rufus, OR.

Member of a team of biologists engaged in activities to monitor and index the seaward migration of juvenile salmonid smolts in the Columbia and Snake River system. Responsibilities included: supervision of on site sampling, training, data recording, coordination of maintenance with the Corps of Engineers, statistical analysis, technical report writing, equipment design, fabrication and repair.

EXPERIMENTAL BIOLOGICAL AIDE, Oregon Department of Fish and Wildlife **4/88 - 2/89**
Clackamas, Oregon 97015.

4/88-9/1 Worked on a sturgeon project setting long lines in the Columbia and collecting data from catch.
9/88-1/89 Worked on the fall chinook evaluation at Bonneville Dam. Collecting and reading coded wire tags.
1/89-2/89 Completed an informational report on the recreational fishery in the John Day reservoir.

BIOLOGICAL TECHNICIAN, U.S. Fish and Wildlife Service **3/88 - 4/88**
Cook, WA.

Worked on a smolt condition project. Collected biological and photographic samples of juvenile salmonids.

FISHERIES EXTENSION OFFICER, U.S. Peace Corps/Dept of Fisheries **11/85 - 11/87**
Banban, Masinloc, Zambales, Philippines.

Worked as a Peace Corps Volunteer in freshwater fisheries. Activities included design and production of an AV presentation on illegal fishing/coral reef conservation (adopted by PC/Philippines and Dept. of Fisheries, for training and education), provided fisheries extension services to rural Filipinos, designed, built and deployed scrap tire artificial reef, coordinated the procurement and distribution of project materials, and administered a donated scholarship fund.

EDUCATION

Bachelor of Science in Fisheries and Wildlife Biology, 1985.
Iowa State University, Ames, Iowa 50010

SPECIAL TRAINING

Fisheries Training, U.S. Peace Corps, Philippines, 9/85-11/85.
Marine Biology, Virgin Islands Research Station, U.S.V.I. 2/85-5/85.

Section 10. Information/technology transfer

Technological innovations and technical information will be transferred through the annual report, journal publications, workshops, conference presentations, public speaking engagements (e.g. Rotary club), technical O & M documents (e.g. Fish Passage Plan) and participation in discussion groups.