
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Smolt Monitoring Program Umbrella

BPA project number: 20552

Contract renewal date (mm/yyyy):

Multiple actions?

Business name of agency, institution or organization requesting funding

Pacific States Marine Fisheries Commission, Idaho Department of Fish & Wildlife, Nez Perce Tribe and USGS

Business acronym (if appropriate)

PSMFC, IDFG, NP, USGS

Proposal contact person or principal investigator:

Name Michele Dehart

Mailing Address 2501 SW First Ave., Ste. 250

City, ST Zip Portland, Oregon 97201

Phone (503) 230-4288

Fax (503) 230-7559

Email address mdehart@fpc.org

NPPC Program Measure Number(s) which this project addresses

3.6F.10 Sections 303, 403b, 1408.2.8, 5.9A.1

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

RPA Section 13 A,C, RPA Section 17

Other planning document references

NMFS Biological Opinion RPA 13 (a) & RPA 17

Short description

Juvenile salmonid migration monitoring for the Columbia and Snake rivers.

Target species

chinook, steelhead, sockeye, coho

Section 2. Sorting and evaluation

Subbasin

Columbia and Snake Rivers

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"/> Multi-year (milestone-based evaluation) | <input type="checkbox"/> Watershed councils/model watersheds |
| <input type="checkbox"/> Resident fish | <input type="checkbox"/> Watershed project evaluation | <input type="checkbox"/> Information dissemination |
| <input type="checkbox"/> Wildlife | | <input type="checkbox"/> Operation & maintenance |
| | | <input 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 |
|-----------|---|
| 20552 | Smolt Monitoring Program |
| 8332300 | Monitor Smolts at the Head of Lower Granite Reservoir & Lower Granite Dam |
| 8712700 | Smolt Monitoring Program (Federal & Non-Federal dams) |
| 8712702 | Comparative Survival Rate Study (CSS) Hatchery PIT tagged chinook |
| 9602100 | Gas Bubble Disease Research & Monitoring of Juvenile Salmonids (one task) |
| 9403300 | The Fish Passage Center |
| 8712703 | Imnaha River Smolt Monitoring Program Project |
| 8401400 | Smolt Monitoring Program - tagging |
| 20542 | Biological Monitoring Of Columbia River Basin Salmonids |

Other dependent or critically-related projects

| Project # | Project title/description | Nature of relationship |
|-----------|---|-----------------------------------|
| 9008000 | Columbia Basin Pit-Tag Information System | Dependent upon tag recapture data |
| | | |
| | | |

Section 4. Objectives, tasks and schedules

Past accomplishments

| Year | Accomplishment | Met biological objectives? |
|------|--|----------------------------|
| 1998 | successful implementation/distribution | yes |
| 1997 | of data to the region | yes |
| 1996 | | yes |
| 1995 | | yes |

Objectives and tasks

| Obj 1,2,3 | Objective | Task a,b,c | Task |
|-----------|---|------------|--|
| 1 | Smolt Monitoring at Lewiston trap and the Salmon River trap | a | Sample daily at dipper trap near Lewiston Idaho, rkm 225 according to FPC/SMP protocol |
| | | b | Sample daily at dipper trap on the Salmon River rkm 103, near Slate Creek, Idaho according to FPC/SMP protocol |
| | | c | Apply PIT tags according to SMP /FPC |

| | | | |
|---|--|---|--|
| | | | protocol at Lewiston trap |
| | | d | Apply PIT tags according to SMP /FPC protocol at Salmon River trap |
| | | e | Conduct data verification procedure according to FPC protocol |
| | | f | Record fish length, and water temperature |
| | | g | Transmit data daily according to FPC established protocol |
| | | h | Prepare annual report |
| 2 | Smolt Monitoring at the Imnaha River | a | Sample daily as defined in the SMP protocol at the Imnaha trap |
| | | b | Transmit data according to the SMP/FPC schedule and protocol |
| | | c | Conduct data verification procedures according to FPC protocols |
| | | d | Prepare annual report |
| 3 | Regional Gas Bubble Trauma monitoring (USGS) | a | Conduct GBT monitoring training Set up training facilities |
| | | b | Conduct Quality control quality assurance visits to Bonneville, John Day and McNary dams |
| 4 | Marking SMP groups (USFWS) | a | PIT tag Chinook and steelhead groups at Dworshak, Leavenworth National Fish Hatcheries |
| | | b | PIT tag chinook and steelhead groups at WDFW hatcheries, Wells, and Priest Rapids. |
| 5 | Maintain SMP remote entry and central database (FPC) | a | Maintain, develop, modify remote data entry and central database for SMP data from all sites |
| | | b | Distribute decimate SMP data via weekly reports and FPC web site |
| | | c | Develop annual report |
| | | d | Develop annual SMP design and workplan |
| | | e | Oversee SMP implementation, provide support to remote site personnel |
| 6 | PIT tag marking (CSS) | a | Apply PIT tag marks on chinook groups from Rapid River, Lookingglass, Imnaha, McCall, Dworshak, Round Butte, Carson, |
| 7 | Smolt Monitoring - Lower Granite | a | Sample migrants daily in the sample system |
| | | b | Monitor Gas Bubble Symptoms according to FPC protocols |
| | | c | Transmit Data according to FPC protocol |
| | | d | Conduct data verification procedure according to FPC protocols |
| | | e | Project management, planning, work statement/budget preparation |
| | | f | Conduct sampling for implementation of the Smolt Transportation Program |
| 8 | Smolt Monitoring - McNary | a | Sample migrants daily in the sample systems |
| | | b | Conduct data verification procedure according to FPC protocol |

| | | | |
|----|-------------------------------------|---|---|
| | | c | Monitor for Gas Bubble Symptoms according to FPC protocols |
| | | d | Transmit Data according to FPC protocol |
| | | e | Project management, planning, work statement/budget preparation |
| | | f | Conduct sampling for implementation of the Smolt Transportation Program |
| 9 | Smolt Monitoring - Grande Ronde | a | Sample migrants daily in the Sample System |
| | | b | Apply PIT Tags |
| | | c | Transmit Data according to FPC protocol |
| | | d | Conduct data verification procedure according to FPC protocol |
| | | e | Monitor for gas bubble symptoms according to FPC protocols |
| | | f | Project management, planning, work statement/budget preparation |
| 10 | Smolt Monitoring - Little Goose | a | Sample migrants daily in the sample system |
| | | b | Monitor Gas Bubble Symptoms according to FPC protocols |
| | | c | Transmit Data according to FPC protocol |
| | | d | Conduct data verification procedure according to FPC protocol |
| | | e | Project management, planning, work statement/budget preparation |
| | | f | Conduct sampling for implementation of the Smolt Transportation Program |
| 11 | Hanford Reach Monitoring | a | Apply PIT Tags |
| | | b | Sample migrants daily in the sample system |
| | | c | Monitor Gas Bubble Symptoms according to FPC protocols |
| | | d | Transmit data according to FPC protocol |
| | | e | Project management, planning, work statement/budget preparation |
| | | f | Conduct data verification procedure according to FPC protocol |
| 12 | Smolt Monitoring - Lower Monumental | a | Sample migrants daily in the sample system |
| | | b | Monitor Gas Bubble Symptoms according to FPC protocols |
| | | c | Transmit data according to FPC protocol |
| | | d | Conduct data verification procedure according to FPC protocol |
| | | e | Project management, planning, work statement/budget preparation |
| | | f | Conduct sampling for implementation of the Smolt Transportation Program |
| 13 | Smolt Monitoring - Rock Island | a | Sample Migrants daily in sample system |
| | | b | Monitor Gas Bubble Symptoms according to FPC protocols |
| | | c | Apply PIT Tags |
| | | d | Transmit Data according to FPC protocol |
| | | e | Conduct data verification procedure according to FPC protocol |
| | | f | Project management, planning, work |

| | | | |
|----|------------------------------------|---|--|
| | | | statement/budget preparation |
| 14 | Smolt Monitoring John Day Dam | a | Sample migrants daily in the sample system |
| | | b | Monitor for gas bubble symptoms according to the FPC protocols |
| | | c | Transmit data according to FPC protocol |
| | | d | Conduct data verification procedures according to FPC protocols |
| | | e | Project management, planning, work statement/budget preparation |
| 15 | Smolt Monitoring at Bonneville Dam | a | Sample migrants daily in the Bonneville I sample system |
| | | b | Monitor for gas bubble symptoms according to the FPC protocol |
| | | c | Transmit data according to the FPC protocol |
| | | d | Conduct data verification procedures according to the FPC protocol |
| | | e | Project management, planning, work statement/budget preparation |
| | | | |
| | | | |
| | | | |
| | | | |

Objective schedules and costs

| Obj # | Start date mm/yyyy | End date mm/yyyy | Measureable biological objective(s) | Milestone | FY2000 Cost % |
|-------|-----------------------|---------------------|--|--------------|------------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | Total | 0.00% |

Schedule constraints

None

Completion date

Annual

Section 5. Budget

FY99 project budget (BPA obligated):

FY2000 budget by line item

| Item | Note | % of total | FY2000 |
|---------------------------|------|---------------|--------|
| Personnel | | %0 | |
| Fringe benefits | | %0 | |
| Supplies, materials, non- | | %0 | |

| | | | |
|---|------------|----|-------------|
| expendable property | | | |
| Operations & maintenance | | %0 | |
| Capital acquisitions or improvements (e.g. land, buildings, major equip.) | | %0 | |
| NEPA costs | | %0 | |
| Construction-related support | | %0 | |
| PIT tags | # of tags: | %0 | |
| Travel | | %0 | |
| Indirect costs | | %0 | |
| Subcontractor | | %0 | |
| Other | | %0 | |
| TOTAL BPA FY2000 BUDGET REQUEST | | | \$ 0 |

Cost sharing

| Organization | Item or service provided | % total project cost (incl. BPA) | Amount (\$) |
|---|--------------------------|----------------------------------|-------------|
| | | %0 | |
| | | %0 | |
| | | %0 | |
| | | %0 | |
| Total project cost (including BPA portion) | | | \$ 0 |

Outyear costs

| | FY2001 | FY02 | FY03 | FY04 |
|---------------------|--------|------|------|------|
| Total budget | | | | |

Section 6. References

| Watershed? | Reference |
|--------------------------|---|
| <input type="checkbox"/> | FPC Annual Reports 1986 – 1987 |
| <input type="checkbox"/> | Water Budget Center Annual Reports 1984 - 1985 |
| <input type="checkbox"/> | Survival of Wells Hatchery Steelhead - SMP 1985 |
| <input type="checkbox"/> | |
| <input type="checkbox"/> | |

PART II - NARRATIVE

Section 7. Abstract

The Columbia, Snake rivers Smolt Monitoring Program (SMP) was included as a measure in the 1982 original NPPC Fish and Wildlife Program. The SMP was established to provide a long-term consistent database as a foundation for development of hydrosystem operations to improve juvenile and adult fish passage conditions. Subsequently the SMP provided the basis for downstream passage measures of the NMFS Biological Opinion for listed Columbia and Snake River anadromous fish stocks.

The SMP provides daily data on movement of smolts out of major river drainage and past the dams on the Snake and Columbia Rivers. Indices of migration strength and migration timing result for the run-at-large at key monitoring sites. In addition, marked smolts from hatcheries, traps, and dams provide measures of smolt speed and in-river survival through key index reaches. Fish quality, descaling and gas bubble trauma measures are taken on samples of fish collected at each monitoring site supplying indicators of the health of the run. The Program affords real time fish passage data to fishery management entities and the hydroelectric power system managers, which they utilize in day-to-day river operations decisions. The SMP provides a continuous long term fish passage database which is utilized in year to year comparisons of smolt travel time, passage timing, passage duration, dissolved gas bubble trauma symptoms, juvenile survival estimates, relative to annual fish passage conditions and hydrosystem operations. The SMP will furnish data useful in the development of future long-term mitigation measures.

Section 8. Project description

a. Technical and/or scientific background

The SMP for the Columbia and Snake River is designed as one basinwide-sampling Program with 11 sampling sites. These are, the Imnaha River trap, the Lewiston trap, the Whitebird (Salmon River trap), the Lower Grande Ronde River trap, Lower Granite, Little Goose, Lower Monumental, McNary, Rock Island, John Day, Bonneville dams. All SMP data is transmitted to a single SQL database at the Fish Passage Center (FPC). All SMP data is distributed as one report, via the FPC Web site and weekly report mailings.

The scope, purpose and intent of the SMP is to provide a technical basis and justification for implementation of hydrosystem operations to enhance fish passage in the mainstem Columbia and Snake rivers. The SMP is reviewed annually relative to sampling constraints and sampling techniques with the objective of limiting fish handling and sampling as much as possible. The annual SMP is considered within the context of planned activities at mainstem dams, such as the Smolt Transportation Program. Dates of sampling at trap sites and mainstem sites are established to provide early indication of fish migration from major tributaries and through the mainstem including planned major hatchery releases. Consistency in sample dates is pursued to support year-to-year comparison of migration timing and duration relative to environmental factors, such as flow, and temperature.

The Smolt Monitoring Program (SMP) provides daily, real-time data on the movement of smolts out of major drainage's and past the series of mainstem dams on the Snake and Columbia Rivers. The SMP provides data for day-to-day hydrosystem management decisions as well as a continuous and consistent database for year-to-year comparison of downstream migration characteristics, and survival relative to passage conditions. Indices of migration strength and migration timing are provided for the run-at-large by species at key monitoring sites. In addition, marked smolts from hatcheries, traps and dams provide measures of smolt speed, and in-river survival through key index reaches. The index reaches are: from the Salmon River trap to Lower Granite Dam; from the Lewiston trap to Lower Granite Dam; from Lower Granite Little Goose Dam; from Lower Granite to Lower Monumental Dam; from Lower Granite to McNary Dam; from Rock Island Dam to McNary Dam; from McNary Dam to John Day dam and from McNary Dam to Bonneville Dam. Fish quality, descaling, and gas bubble trauma measures are taken on samples of fish collected at each monitoring site and provide indicators of fish health. In addition SMP sampling provides data on fish length and raceway loading densities necessary for implementation of the smolt transportation program at Lower Granite, Little Goose, Lower Monumental and McNary dams. These

data are utilized for in-season operational decisions relative to flow and spill management, including implementation of NMFS Biological Opinion downstream passage measures. SMP gas bubble trauma monitoring is required by the states water quality agencies as a prerequisite for implementation of the NMFS Biological Opinion spill for fish passage measures.

The SMP was developed with the objective of building a long-term consistent database. Various approaches were considered in developing the basic structure and design of the SMP. The methodologies for development of passage indices occurred as a result of a regional effort of the state and federal fishery management agencies. In addition ad-hoc groups of independent statisticians were consulted to review and provide input on these methodologies. SMP sampling protocols are designed within the constraints of the ESA section 10 permit requirements, and within the protocols established by the fishery management agencies and tribes. SMP protocols are reviewed annually and modified if necessary as a result of facility modifications or other changes particularly at Federal projects.

A. Monitoring Activities by Contracting Entities:

Idaho Department of Fish and Game

1. **Salmon River trap and Snake River trap** -- Operate a scoop trap on the lower Salmon River above Whitebird for a 12-week period from March 7 to May 28, five days per week. Operate a dipper trap on the lower Snake River at Lewiston for a 12-week period from March 14 to June 4, five days per week. In 1999, PIT tag both chinook and steelhead with the goal of providing travel time and survival indices from trap to downstream dams. The numeric breakdown of fish to PIT tag by week and trap is given in Table 1. The total trap allocations for the season are 12,000 tags at the Salmon River trap and 11,400 tags at the Snake River trap.
2. **Rapid River and McCall hatcheries** – PIT tag a total of 45,000 spring chinook at Rapid River Hatchery, 45,000 summer chinook at McCall Hatchery for the *1999 Comparative Survival Study* (Table 4). The Rapid River Hatchery and McCall Hatchery fish will be PIT tagged in the spring.

Oregon Department of Fish and Wildlife

1. **Grande Ronde River trap** -- Operate a scoop trap on the lower Grande Ronde River 5 km upstream of the mouth for a 12-week period from March 14 to June 4, five days per week. In 1999, PIT tag both chinook and steelhead with the goal of providing travel time and survival indices from trap to downstream dams. The numeric breakdown of fish to PIT tag by week is given in Table 2. The total trap allocation for the season is 7,600 tags.
2. **Lookingglass and Imnaha hatcheries** -- PIT tag a total of 45,000 spring chinook at Lookingglass Hatchery and 20,000 summer chinook at Imnaha Hatchery for the *1999 Comparative Survival Study* (Table 4). Imnaha Hatchery fish will be PIT tagged at Lookingglass Hatchery in the spring prior to transfer to Imnaha Hatchery. The Lookingglass Hatchery fish will be PIT tagged in the spring.
3. **Little Goose Dam** -- Sample smolts from the collection facility from April 1 to October 31 for counts by species and hatchery/wild status, and for assessing smolt quality including descaling. Anticipate the need to post-season determine the number of PIT tagged smolts (by species and hatchery/wild category) that were not originally counted in the collection during the summer due to the PIT tag override of sample protocol. Continue oversight of the gas trauma monitoring in 1999. See Section C for details.

Nez Perce Tribe

1. **Imnaha River trap** – As in prior years, split funding of the trap operation between SMP and Lower Snake River Compensation Study (LSRCS)

funds. Ensure operation of the screw trap in the lower Imnaha River between March 14 and June 4, five days per week, with your operation outside this period covered by LSRCs. As in prior years the SMP will cover the PIT tagging of steelhead at the trap. The numeric breakdown of fish to PIT tag by week is given in Table 2. The total trap allocation for the season is 4,600 tags.

Washington Department of Fish and Wildlife

1. **Lower Granite Dam** -- Sample smolts from the collection facility from March 25 to October 31 for counts by species and hatchery/wild status, and for assessing smolt quality including descaling. Anticipate the need to post-season determine the number of PIT tagged smolts (by species and hatchery/wild category) that were not originally counted in the collection during the summer due to the PIT tag override of sample protocol. Continue oversight of the gas trauma monitoring in 1999. See Section C for details.
2. **Lower Monumental Dam** -- Sample smolts from the collection facility from April 1 to October 31 for counts by species and hatchery/wild status, and for assessing smolt quality and descaling. Anticipate the need to post-season determine the number of PIT tagged smolts (by species and hatchery/wild category) that were not originally counted in the collection during the summer due to the PIT tag override of sample protocol. Continue oversight of the gas trauma monitoring in 1999. See Section C for details.
3. **McNary Dam** -- Sample smolts from the collection facility from March 25 to the end of the transportation season. In recent years, this season has extended as late as mid-December when inclement weather has curtailed the trucking of smolts due to safety concerns. Budget monitoring through December 15. Data will include counts by species and hatchery/wild status, and information on smolt quality including descaling. Continue oversight of the gas trauma monitoring in 1999. See Section C for details.
4. **Ice Harbor Dam** -- Conduct GBT monitoring at this site under the SMP. See Section C for details.
5. **Hanford Reach** -- PIT tag up to 3,000 wild subyearling fall chinook greater than 60 mm collected in Hanford reach in early June during the WDFW/Yakima tribes annual fall chinook CWT program (Table 6).

Chelan County Public Utilities District/Washington Department of Fish and Wildlife.

1. **Rock Island Dam** -- Sample smolts from the collection facility from April 1 to August 31 for counts by species and hatchery/wild status, and for smolt quality including descaling. PIT tag yearling and subyearling chinook, hatchery and wild steelhead, and sockeye, with the goal of providing travel time and survival indices from trap to downstream dams. The numeric breakdown of fish to PIT tag by week is given in Table 3. The total allocation for the season is 4000 yearling chinook, 3400 sockeye, 1200 wild steelhead, and 2800 hatchery steelhead during the spring migration period, and up to 4800 subyearling chinook during the summer migration period (16,200 tags total). Continue oversight of the gas trauma monitoring in 1999. See Section C for details.
2. **Turtle Rock Hatchery** -- Do not PIT tag for the SMP at Turtle Rock Hatchery in 1999.

National Marine Fisheries Service

1. **John Day Dam** -- Sample smolts from the new bypass collection facility in 1998 from April 1 to October 31. The monitoring season may be shortened based on 1997 monitoring results regarding late season PIT tag recovery numbers and impacts of facility operation on adult steelhead and fall chinook fallbacks as requested by NMFS. Continue oversight of the gas trauma monitoring in 1999. See Section C for details.

2. **Bonneville Dam Powerhouse 1** -- Sample smolts from the Powerhouse 1 collection facility from March 8 to October 31 for counts by species and hatchery/wild status, and for smolt quality including descaling. Sample smolts with the bypass trap seven days per week, one shift per day (4 PM to 12 AM), and run all sampled fish through PIT tag detectors. Operate the PIT tag flat plate detection system seven days per week, 24-hr per day, from April 1 until the end of the season or until the number of PIT tag detection becomes negligible. Continue oversight of the gas trauma monitoring in 1998. See Section C for details.
3. **Bonneville Dam Powerhouse 2** -- At Powerhouse 2, sample smolts from the collection facility three times per week for smolt quality including descaling starting April 1. Operate the PIT tag detector at Powerhouse 2 seven days per week, 24-hr per day, from April 1 until the normal operation of the second powerhouse ends in the early fall (terminate earlier if PIT tag detection numbers drop to negligible numbers).

U.S. Fish and Wildlife Service

1. **Snake River drainage** -- PIT tag 45,000 spring chinook at Dworshak Hatchery in the spring for the *1999 Comparative Survival Study* (Table 1). In addition, PIT tag 1500 steelhead (spilt into sublots of 500 fish within each hatchery water system) at Dworshak Hatchery
2. **Mid-Columbia River drainage** -- In order to obtain survival estimates from hatchery to McNary Dam in 1999 for two spring chinook stocks and one summer chinook stock. PIT tag 7500 spring chinook at Leavenworth Hatchery, 7500 spring chinook at Winthrop Hatchery, and 6000 subyearling summer chinook at Wells Hatchery. PIT tag 3000 fall chinook at Priest Rapids Hatchery (1000 fish per pond release randomly spread across the first, third, and fifth scheduled releases). The total PIT tag allocation for these Mid-Columbia hatcheries for 1998 is 15,000 yearling chinook and 9000 subyearling chinook (Table 6).
3. **Lower Columbia River drainage** -- PIT tag 7500 spring chinook at Carson Hatchery and 7500 spring chinook at Round Butte Hatchery for the *1999 Comparative Survival Study* (Table 5). The fish at Carson and Round Butte hatcheries will be PIT tagged in the spring.

B. Gas Bubble Trauma Monitoring Requirements

1. **Sampling**
Each site is to examine 200 fish per day (100 chinook and 100 steelhead, when available), 3 days per week, or every other day when TDGS levels are at or above the water quality standards. Examiners are to follow the 1998 protocol for GBT monitoring (until the 1999 document is available use the 1998 monitoring protocol) for procedures regarding fish examination and handling. Sampling start time during the monitoring season may have to be adjusted in order to capture the target number of fish.
2. **Data Recording**
Data will be recorded to data sheets similar to 1998. Recorded data sheets will be faxed to FPC no later than 7:00 am the day following the sample. In the case of nighttime sampling the data must be faxed before 7:00 am the same date of sampling. Data will be entered to a spreadsheet each day sampling is conducted. The spreadsheet data quality control is the responsibility of the site. Quality control will involve checking the format of the data as well as the content to make sure it is in the proper format and accurately represents the recorded data. The checked data spreadsheet file will be sent to the FPC by 7:00 am the day after sampling has been conducted. In the case of nighttime

sampling the data will be sent to FPC before 7:00 am the same morning. The Fish Passage Center will send a copy of the daily GBT report to all sites via email. Each site is responsible for checking the report to make sure the data accurately reflects the data collected at the site that day. If an error is found by the site, a reply is required on the next date GBT sampling occurs at the site. Information on incidental fish handled but not examined for GBT will also be entered to the GBT spreadsheet.

3. Length of Season for GBT Monitoring

April 5 through August 30, 1998: Bonneville, John Day, McNary, and Rock Island dams.

April 5 through June 30 (End date could be earlier depending upon fish availability and spill levels): Lower Granite, Little Goose, Lower Monumental, and Ice Harbor dams.

Training will be conducted the last week of March and first week of April. All persons that will be doing GBT examinations are required to attend training class.

4. Equipment

Sites are to provide anesthetic, nets, and set up a location for examining fish. Fish Passage Center will provide dissecting scopes and other gear specifically related to GBT exams.

C. 1998 Comparative Survival Study

1. **Smolt stocks** -- The hatchery list and PIT tag quotas for 1999 are listed under the agencies responsible for tagging and in Tables 4 and 5. Study work plan is attached to the SMP document.
2. **Diversion at Lower Granite Dam** – Coordinate to continue the PIT tag separation-by-code methodology in 1999 to divert a known proportion of study fish to transport and the remainder back to river.
3. **Smolt PIT tag detectors at hatcheries** – Develop PIT tag detection capability for smolts emigrating from Rapid River Hatchery.
Task (a): Determine feasibility and develop scope for installation of equipment needed to detect smolts exiting hatchery ponds.
Task (b): Establish contracts for installation and operation of equipment and submission of data to PITAGIS
4. **Adult PIT tag detectors at hatcheries** -- Develop PIT tag detection capabilities for returning adults at study hatcheries.
Task (a): Develop scope for installation of equipment needed to detect adults returning to the hatcheries in a manner that PIT tag code for individual fish may be directly linked to the individual length, sex, and scale sample being taken on that fish.
Task (b): Establish contracts for installation and operation of equipment and submission of data to PITAGIS.

Table 1. 1999 SMP weekly PIT tagging at the Salmon and Snake River traps.

| Week begins | Salmon River Trap | | | | Snake River Trap | | | |
|--------------|-------------------|------------------|----------------|--------------------|------------------|------------------|----------------|--------------------|
| | Wild chinook | Hatchery chinook | Wild steelhead | Hatchery steelhead | Wild chinook | Hatchery chinook | Wild steelhead | Hatchery steelhead |
| 3/07 | 200 | | | | | | | |
| 3/14 | 200 | 200 | | | | | | |
| 3/21 | 600 | 200 | | | | | | |
| 3/28 | 200 | 600 | | | 200 | 200 | | |
| 4/04 | 600 | 600 | 200 | 200 | 600 | 200 | 200 | 200 |
| 4/11 | 200 | 600 | 200 | 600 | 200 | 600 | 200 | 600 |
| 4/18 | 600 | 600 | 200 | 600 | 600 | 600 | 200 | 600 |
| 4/25 | 200 | 600 | 200 | 600 | 200 | 600 | 200 | 600 |
| 5/02 | 200 | 200 | 200 | 600 | 600 | 600 | 200 | 600 |
| 5/09 | 200 | 200 | 200 | 600 | 200 | 600 | 200 | 600 |
| 5/16 | | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| 5/23 | | | | | | | | 200 |
| Total | 3200 | 4000 | 1400 | 3400 | 2800 | 3600 | 1400 | 3600 |

Table 2. 1999 SMP weekly PIT tagging at the Grande Ronde and Imnaha River traps.

| Week begins | Grande Ronde River Trap | | | | Imnaha River Trap | |
|--------------|-------------------------|------------------|----------------|--------------------|-------------------|--------------------|
| | Wild chinook | Hatchery chinook | Wild steelhead | Hatchery steelhead | Wild steelhead | Hatchery steelhead |
| 4/04 | 200 | 600 | | | | |
| 4/11 | 200 | 600 | 200 | 200 | 200 | |
| 4/18 | 200 | 200 | 200 | 600 | 200 | |
| 4/25 | 200 | | 200 | 600 | 200 | 600 |
| 5/02 | 200 | | 200 | 600 | 200 | 600 |
| 5/09 | 200 | | 200 | 600 | 200 | 600 |
| 5/16 | 200 | | 200 | 600 | 200 | 600 |
| 5/23 | | | | 200 | 200 | 600 |
| 5/30 | | | | 200 | | 200 |
| Total | 1400 | 1400 | 1200 | 3600 | 1400 | 3200 |

Table 3. 1999 SMP weekly PIT tagging at Rock Island Dam.

| Week begins | Rock Island Dam | | | |
|--------------|------------------|--------------------|----------------|---------------|
| | Yearling chinook | Hatchery steelhead | Wild steelhead | Total sockeye |
| 4/11 | 200 | | | 200 |
| 4/18 | 600 | 200 | 200 | 600 |
| 4/25 | 600 | 600 | 200 | 600 |
| 5/02 | 600 | 600 | 200 | 600 |
| 5/09 | 600 | 600 | 200 | 600 |
| 5/16 | 600 | 600 | 200 | 600 |
| 5/23 | 600 | 200 | 200 | 200 |
| 5/30 | 200 | | | |
| Total | 4000 | 2800 | 1200 | 3400 |

At Rock Island Dam, subyearling chinook will be PIT tagged between mid-June and mid-August with the goal of 600 fish per week for the major 8 weeks of the migration (seasonal total of 4800 fish).

Table 4. 1999 SMP PIT tagging of chinook at hatcheries above Lower Granite Dam.

| Hatchery | Tag # |
|--------------|--------|
| Lookingglass | 45,000 |
| Imnaha | 20,000 |
| McCall | 45,000 |
| Rapid River | 45,000 |
| Dworshak | 45,000 |

Table 5. 1999 SMP PIT tagging of chinook at hatcheries in the lower Columbia River.

| Hatchery | Tag # |
|-------------|-------|
| Round Butte | 7,500 |
| Carson | 7,500 |

Table 6. 1999 SMP PIT tagging of chinook in the Mid-Columbia River.

| Source | Age | Tag # |
|--------------------|-----|-------|
| Leavenworth NFH | 1 | 7,500 |
| Winthrop NFH | 1 | 7,500 |
| Priest Rapids SFH | 0 | 3,000 |
| Wells SFH | 0 | 6,000 |
| Hanford Reach Wild | 0 | 3,000 |

b. Rationale and significance to Regional Programs

The SMP data is significant to several regional programs. Historical SMP data has provided the basis for development and implementation of Biological Opinion measures and Northwest Power Planning Council Fish and Wildlife Program measures. Each year the SMP provides data for daily and weekly passage management decisions used in implementation of NMFS Biological Opinion measures. The SMP data is utilized in the PATH analysis of recovery options for listed stocks. SMP sampling also recovers mark groups from various activities, providing recapture data to the originating entity. Gas Bubble trauma symptom monitoring through the SMP is a pre-requisite established by NMFS and the state water quality agencies to implementation of the NMFS Biological Opinion spill for fish passage measures.

c. Relationships to other projects

The Umbrella SMP project incorporates the following projects, which have been, described in individual contract proposals. #8332300-Monitor Smolts at the Head of Lower Granite Reservoir, #8712700 - Smolt Monitoring Program, #8712702-Comparative Survival Rate Study, #9602100-Gas Bubble Disease Research and Monitoring of Juvenile Salmonids

(one task only), #940330 -The Fish Passage Center, #8712703-Imnaha River Smolt Monitoring Program, #8401400-Smolt Monitoring Program Tagging.

d. Project history (for ongoing projects)

The SMP began in 1984 to implement downstream measures of the Northwest Power Planning Councils' first Fish and Wildlife Program. Previous to that point National Marine Fisheries Service had implemented downstream Smolt monitoring in conjunction with their research activities on the Snake River. The NPPC initiated the SMP, including the mid-Columbia to provide a basis for NPPC Fish and Wildlife Program flow and passage measure implementation. Prior to 1994, the SMP project also included the Fish Passage Center activities. Studies to develop estimates of juvenile survival in specific river reaches were included in the SMP from 1984 through 1987. The survival estimation activities were eliminated from the SMP subsequent to 1997, because analysis showed that key assumptions of the study design could not be met with available techniques.

Sampling at the Lewiston and Clearwater trap has occurred as part of the SMP since 1985 as an individual project contract with Idaho Department of Fish and Game. Prior to that, traps at Lewiston and Clearwater River sites were operated by NMFS. Marking at the Lewiston trapped changed from freeze branding to PIT tagging in 1990. In 1993 in response to NPPC Scientific Advisory Board review a trap was added on the lower Salmon River. In 1996 the Clearwater trap site was eliminated. In 1991 again in response to review the Imnaha trap sampling was added to the SMP database. Imnaha trapping and marking had been initiated earlier in conjunction with the Lower Snake River Compensation Plan activities. Sampling at Rock Island has been included in the SMP since the inception of the Program. PIT tagging at Rock Island Dam was initiated in 1990. SMP sampling has occurred at Lower Granite Dam since 1985 in conjunction with the implementation of the COE Smolt Transportation Program. SMP sampling has occurred concurrently with the COE transportation Program at Little Goose and Lower Monumental dams. Funding at these sites is split between COE required activities and SMP required activities. Sampling at the Imnaha trap, Lower Granite, Little Goose, the Grande Ronde trap and Lower Monumental and McNary dams is presently conducted by state agencies. This sampling effort has been consolidated into one contract through PSMFC, #8712700. Sampling occurred at John Day and Bonneville since 1985. Sampling and passage index calculation changed at John Day when a full bypass sampling system was installed in 1998. Sampling at these sites was conducted by National Marine Fisheries Service and was contracted directly with BPA under contract # 8401400. In 1995 Gas Bubble Trauma monitoring was included in the SMP as a requirement of the state, water quality agencies approval of implementation of the NMFS spill for fish passage program.

In 1994 the FPC activities were removed from the SMP contract #8712700 through PSMFC, and placed in a separate contract #9403300 through PSMFC. In 1998 upon request of the Nez Perce Tribe, Imnaha River trap sampling was split away from contract #8712700 and modified into an individual contract, #8712703, directly between the Nez Perce tribe and BPA. In 1999 Contract numbers #8401400 and #8332300 was consolidated into contract #8712700 through PSMFC. In 1997 with the advent of the Comparative Survival Study, several mark hatchery spring Chinook groups were eliminated from the SMP. CSS marked groups of hatchery spring Chinook are utilized for SMP purposes.

e. Proposal objectives

1. Acquire daily sample data at 11 monitoring sites according to the established schedule and protocol for each site. Conduct daily sampling according to protocol of SMP and ESA section 10 permit.
2. Validate, verify and transmit data to FPC, daily prior to 10:00 AM.
3. Conduct gas bubble trauma symptom monitoring at sites according to the Regional Monitoring Program developed by NMFS and approved by Washington Department of Ecology and the Oregon Department of Environmental Quality.
4. Develop daily passage indices and catch reports for each site, FPC posts on Website.
5. Conduct sampling required for implementation of smolt transportation program at transportation sites.
6. Develop annual report
7. Collect mark recapture data transmit data according to FPC protocol.
8. Apply PIT tags at sites included in the SMP annual plan.

f. Methods

Smolt Monitoring Program Analytical Procedures:

The Smolt Monitoring Program collects data on relative fish abundance at dams, fish migration timing at traps and dams, fish travel time between monitoring sites, fish survival from traps and dams to downstream monitoring sites, and smolt-to-adult return ratios for fish released from key hatcheries. Some of this data are generated for each species from the run-at-large and some of this data is generated from specially marked groups of fish. All of this data is collected for the purpose of in-season management of flows and spills and the post-season evaluation of the effect of that year's management actions on migrating salmonids.

1. Relative fish abundance at dams

In the March through October weekly reports prepared by the Fish Passage Center, a daily passage index is presented for each species and rearing type available in the run-at-large. As long as these daily passage indices remain highly correlated with daily population abundance existing at a given monitoring site, the fishery managers may use the daily passage indices to effectively determine significant shifts in passage at that monitoring site. The actual value of fish guidance efficiency of the screens or effectiveness of spill is not required, only the existence of seasonal stability of these factors is required. The daily passage indices account for daily changes in spill proportion under the conservative assumption that the proportion of fish passing through spill will be close to the proportion of water being spilled. For these reasons, when the Smolt Monitoring Program began in 1984, the use of daily passage indices was chosen over attempts to estimate daily absolute population sizes. The daily passage index is computed by dividing the daily collection by the proportion of water passing through the powerhouse where the sampling takes place (or turbine unit when only gatewell sampling occurs). At monitoring sites where a sample timer is used to systematically divert a fixed proportion of fish into a sample tank for processing, the resulting sample number is divided by the sample rate to arrive at the estimated collection number. Post-season the daily passage indices are summed for the season at a given site to provide an annual passage index for each species and rearing type available. This annual passage index reflects the strength of the particular run for the given year. The

passage index is not applicable to the trap sites, and so only collection counts are reported.

Table 1. Formulas to compute passage indices from collection numbers at dams.

| Sampling Site | Years | Collection Formula | Passage Index Formula |
|------------------------|---------|---------------------------|-----------------------|
| Rock Island Dam (PH 2) | 1985-98 | Catch / 1 | $PH2/(PH1+PH2+SP)$ |
| Lower Granite Dam | 1984-98 | Catch / sample rate | $PH/(PH+SP)$ |
| Little Goose Dam | 1984-98 | | |
| Lower Monumental Dam | 1993-98 | | |
| McNary Dam | 1984-98 | | |
| John Day Dam (bypass) | 1998 | Catch / sample rate | $PH/(PH+SP)$ |
| John Day Dam Unit 3 | 1984-97 | Catch / 1 | $Unit3/(PH+SP)$ |
| Bonneville Dam (PH 1) | 1986-92 | 8 hr catch / sample rate | $PH1/(PH1+PH2+SP)$ |
| | 1993-95 | 24 hr catch / sample rate | |
| | 1996-98 | 8 hr catch / sample rate | |

Legend: PH=powerhouse flow; PH1=first powerhouse flow; PH2=second powerhouse flow; SP=spill flow; and Unit3=turbine unit 3 flow (note: all flows are daily average values).

2. Fish migration timing at traps and dams

The distribution of the daily passage indices at the dams provides a measure of migration timing at a given site. From the passage distributions at each dam, key cumulative percentiles of 10%, 50%, and 90% are typically reported for each species and rearing type available each year. This passage timing data is computed for the run-at-large as well as key marked groups. Marking in the early years of the Smolt Monitoring Program consisted of freeze branding the skin of the fish. During the past decade, the shift has been away from freeze branding and toward the use of PIT (passage integrated transponder) tags implanted into the gut cavity of the fish. These tags provide a unique alphanumeric code to each individual fish. So in addition to simple migration timing of PIT tagged fish from key releases of interest (key hatcheries or streams), the PIT tagged fish provide more complete information on individual travel times of fish, as well as a means to conduct tag-recapture studies to estimate survival of groups of smolts.

3. Fish travel time between monitoring sites

Travel time is estimated from release to first detection site, and between series of dams, by subtracting the upstream detection date and time from the downstream detection date and time for PIT tagged fish. Travel time for groups of fish are summarized by the group's median travel time. With freeze-branded groups of fish, the estimate of median travel time was determined using the passage timing distribution. From the date of median passage at the downstream site one would either subtract the median date of release or median date of passage at the upstream site to obtain the duration of time in transit between the two locations. Median travel times are related to flow and other factors such as spill proportion, river temperature, photoperiod, and fish length through regression analysis. Key index reaches for the estimation of travel time include Lewiston trap to Lower Granite Dam, Lower Granite Dam to McNary Dam, McNary Dam to either John Day or Bonneville Dam, and Rock Island to McNary Dam.

4. Fish survival from traps and dams to downstream monitoring sites

Survival is estimated from release to first detection site, and between series of dams, by the Jolly-Seber release-recapture method outlined in American Fisheries Society Monograph 5, *Design and analysis methods for fish survival experiments based on release-recapture*, by K.P. Burnham, D.R. Anderson, G.C. White, C. Brownie, and K.H. Pollock, 1987. For a specified group of fish, this methodology provides a group estimate of survival through a series of reservoirs and dams, as well as a group estimate of collection efficiency at the dams. For the group of PIT tagged fish of interest, this method uses the subsequent detection information on the known number of fish re-released at a particular dam to estimate the number of fish that past that particular dam alive but undetected. By adding the number of fish detected at the dam and the estimated number of fish alive but undetected passing the dam, we have an estimate of the total number of fish from the group of interest at that particular site. Dividing that estimated total by the estimated total of an upstream dam, we arrived at the survival estimate from the tailrace of the upstream dam to the tailrace of the downstream dam. If one divides by the release number, then an estimate of

survival from release to the tailrace of the downstream dam of interest is obtained. The estimates of survival for groups of interest may be related to flow, spill proportion, river temperature, photoperiod, and fish length through regression analysis, just as in the case of the median travel time data.

5. Smolt-to-adult return ratios for fish released from key hatcheries

Five hatcheries in the Snake River basin have been chosen to index the outmigration success of yearling chinook originating above Lower Granite Dam. Spring chinook from the Clearwater, Grande Ronde, and Salmon rivers and summer chinook from the Imnaha and Salmon rivers are PIT tagged and used in this evaluation. Since 1997 a portion of the PIT tagged fish from these five hatcheries have been routed to transportation or back to the river at Lower Granite Dam. Besides being part of the in-river migrant group, the fish routed back to the river are used to estimate the number of study fish alive but undetected at Lower Granite Dam as described above in the survival estimation methodology. Any fish subsequently transported at Little Goose, Lower Monumental, or McNary dams are also removed from the in-river group and assigned to the transport group. Returning adults are detected at Lower Granite Dam as well as back at the hatcheries. Smolt-to-adult ratios from transported and in-river migrating groups will be statistically compared. In addition to the hatchery groups released above Lower Granite Dam, two lower Columbia River hatchery groups are used assess limited dam passage and ocean conditions. PIT tagged spring chinook from Carson Hatchery and 100% coded-wire-tagged spring chinook from Round Butte Hatchery are used to index smolt-to-adult return ratios for lower Columbia River stocks. These lower Columbia River fish pass through only one or two dams compared to the eight dams on the Snake River fish.

g. Facilities and equipment

Juvenile Salmonid Dipper Trap – Salmon River

Juvenile Salmonid Scoop Trap – Snake River Lewiston Idaho

Juvenile Salmonid Scoop Trap - Lower Grande Ronde

Downstream migrant weir – Imnaha River

COE Powerhouse Bypass sampling facilities at Lower Granite, Little Goose, Lower Monumental, McNary, John Day and Bonneville dams.

Powerhouse sampling facilities Rock island 2nd Powerhouse.

Computer hardware, software data entry transmission and management programs.

PIT tag equipment and supplies.

h. Budget

The budget for SMP is developed in individual components by individual sampling project leaders, according to the guidelines of their own agencies and the guidelines of the Pacific States Marine Fisheries Commission. Annual review of the SMP strives to avoid duplication with other efforts, where possible using other mark groups for SMP purposes. Recent consolidation of contracts has resulted in cost savings, particularly in some overhead charges.

Section 9. Key personnel

Tom Berggren -FPC

Larry Basham -FPC

Henry Franzoni -FPC

Rick Martinson – PSMFC

Charlie Morrill – WDFW

Jerry McCann - FPC

Paul Wagner - WDFW

Anne Setter – ODFW

Paul Kucera – Nez Perce Tribe
Edwin Buettner – IDFG
Walt Ambrogetti - USFWS

Resumes, as available, follow:

Thomas J. Berggren
4921 SE 43 Ave
Portland, OR 97206
(503) 774-2016

Title: Biometrician

FTE: 1 (40 hrs/week)

Description of duties: Provide oversight on design/analysis aspects of Smolt Monitoring Program. Analyze the data collected from monitoring sites, as well as the PIT tagged data for groups released in the Smolt Monitoring Program to arrive at smolt travel times and survivals. As adult returns from the 1996 to 1998 PIT tag releases from key hatcheries in the Snake and lower Columbia River become complete for each brood year, I will estimate SAR's and analyze return rates with respect to whether fish migrated in-river or were transported. Responsible for completion of sections of Fish Passage Annual Report related to the Smolt Monitoring Program.

Experience:

- Fish Passage Center, Portland OR – February 1986 to present. Biometrician on Smolt Monitoring Program.
- Bonneville Power Administration, Portland OR – March 1982 to February 1986. Fishery Biologist within Fish and Wildlife Division (2 yrs) and Statistician within Forecasting Division (2 yrs).
- Beak Consultants, Portland OR – October 1979 to March 1982. Fishery Biologist/Analyst providing statistical support to staff of fish and wildlife biologists and botanists.
- Texas Instruments, Buchanan NY – March 1974 to January 1978. Fishery Biologist/Analyst providing operational and analytical oversight on study of Stripped Bass demographics in Atlantic fishery.

Education:

- Master of Science, May 1981 from Cornell University in Department of Plant Breeding and Biometry, Ithaca NY. Coursework in statistics and biometry completed between January 1978 and October 1979, with thesis completed May 1981.
- Master of Science, March 1974 from University of Washington in College of Fisheries, Seattle WA. Coursework emphasized fishery population dynamics and mathematics/statistics.
- Bachelor of Science, June 1971 from University of Washington in College of Fisheries, Seattle WA. Coursework emphasized quantitative science and mathematics.

Recent Publications:

- Berggren, TJ and MJ Filardo, 1993. An analysis of variables influencing the migration of juvenile salmonids in the Columbia River basin. North American Journal of Fisheries Management, Vol 13 (1): 48-63.
- Chapter on Smolt Monitoring Program in each Annual Report of the Fish Passage Center since 1986.

Larry R Basham
222 Davis Rd
Skamania, WA 98648
(509) 427-4177

Work Experience

Field Operations Coordinator – Fish Biologist 12/83 to present
Smolt Monitoring Program
Fish Passage Center, Portland, OR

- Responsible for coordination of hatchery release schedules in the Columbia River Basin; coordination of marking of juvenile fish for Smolt Monitoring Program, including dissemination of freeze brand tools, PIT tagging fish for SMP, and other methods of marking fish. Responsible for field coordination for the FPC SMP including in season and planning of mark groups to be used at the hatcheries or trapping sites. Responsible for reporting pertinent information to FPC manager and Fish agencies and tribes. Responsible for writing sections of the Fish Passage Center annual report.
- Allotted time – 2/3 FTE for SMP and CSS programs.

Fish Biologist, Chairman of Fish Transportation Oversight Team 12/80-12/83
National Marine Fisheries Service, Portland, OR

- Responsible for setting up an oversight team for the juvenile fish transportation program for the NMFS that would transition from a research program to a management program that included Federal and State agencies. Responsible for developing criteria for operating transport and sampling facilities on the Snake and Columbia River. Responsible for writing the initial Fish Transportation Oversight Team Annual Report. Responsible for coordination of all matters relating to fish transportation with the State and Federal fish agencies and tribes.

Fish Biologist, Fish Transportation Program (Research) 7/75-12/80
National Marine Fisheries Service, Pasco, WA

- Responsible for day-to-day operation of fish transportation program at Little Goose Dam from 1976-80.
- Responsible for operation of adult trapping facility at Bonneville Dam from 1978-80.
- Responsible for writing sections of research reports of transport operations at Little Goose Dam.
- Wrote or co-authored several publications.

Fish Technician, Snake River Transportation Program Research 3/72-6/75
National Marine Fisheries Service, Pasco, WA

- Assisted project leaders at Little Goose Dam with operation of the adult trapping facility, marking juvenile fish for the research program, and compilation of data at site.

Education

1969 - Bachelor of Arts in Biological Science, Northwest Nazarene College, Nampa, ID
1969-1971 – US Army Military Trng
1975 – Completed summer work at UofI in fisheries credits to qualify as biologist

Henry James Franzoni III

Current Employer and Responsibilities:

Fish Passage Center, Data System Administrator Manager – responsible for the development, implementation, administration, and maintenance of the data collection system of the Smolt Monitoring Program. Responsible for development, implementation, administration, and maintenance of all other data acquisition and data storage systems used by the Fish Passage Center.

Previous Employment:

AT&T Certified Software Engineer - Interactive Northwest/Lucent Technologies/AT&T, Portland OR 1994-1997 (Application and System Development)

Computer Consultant - Admiralty Beverage, Ltd, Roberti's Distributing, Inc., American Tinnitus Association, Portland OR 1988-1994 (Application and System Development).

Computer Consultant - First Interstate Bank, Willamette Industries, Standard Insurance, Portland OR 1988-1989 - (Application and System Development)

Computer Consultant - Mississippi Supreme Court, Jackson Mississippi 1988 (Application and System Development)

Computer Consultant - Switzerland Cheese Association, SwissMart USA, SwissMart Canada, Hofer Associates, Switzerland Cheese Union. New York, NY 1984-1988 (Application and System Development)

Expertise:

1) Development and implementation of large scale computer systems for governments and Fortune 500 companies. 2) Development and implementation of large and small scale computer databases. 3) Computer systems and techniques in general, including software application design and development, hardware installation and configuration, network design and implementation (LAN, WAN, and Internet), and most varieties of electronic communications. 4) Design, development, implementation, and maintenance of complex World Wide Web applications. 5) Complex project management and coordination.

Education:

Reed College, Portland OR 1974-1979

Statistical Process Control - Ford Motor Company, Pennsylvania, 1985

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

WORK 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 research 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.

RESUME
Paul A. Kucera

CURRENT POSITION: Director of Biological Services
Nez Perce Tribe Dept. of Fisheries Resources Management
P.O. Box 365
Lapwai, Idaho 83540
(208) 843-2253, extension #2435

EDUCATION: Bachelor of Science, 1975 Utah State University
Major: Fisheries Management.
Graduate Studies, 1984-1987 University of Idaho
Major: Fisheries Management.

PROFESSIONAL EXPERIENCE:

Mr. Kucera has 23 years professional experience (1975-1998) as a Fisheries Biologist in research, management and administration and is a Certified Fisheries Scientist through the American Fisheries Society. Conducted ecological and fish life history research on resident and anadromous salmonids and population dynamics work on Pacific salmon. Management and administrative experience with both resident and anadromous fish species. Mr. Kucera has authored or co-authored seven peer-reviewed fisheries journal publications and over 40 project reports. He is responsible for technical program direction and administration of the Fisheries Research Division for the Nez Perce Tribe.

UNIQUE ABILITIES:

- Certified Fisheries Scientist - AFS.
- Experienced with Endangered Species Act and management of listed fish.
- Experience in program development and procuring project funding.
- Ecological and fish life history research on resident and anadromous fish.
- Population dynamics experience with Pacific salmon.
- Management experience with resident and anadromous species.
- Familiar with Tribal government and Columbia Basin fisheries management.
- Snake River water rights adjudication experience.
- Trained in CPR and First Aid.
- Certified SCUBA diver - NAUI.

RESUME

Ann Loudon Setter

Office Address

ODFW

65495 Alder Slope Rd.
Enterprise, OR 97828

Telephone:(541) 426-9052
email:asetter@OregonVos.net

EDUCATION

Master of Science in Fisheries, May 1988. School of Fisheries, University of Washington, Seattle, Washington.

Bachelor of Science in Fisheries, December 1979. College of Fisheries, University of Washington, Seattle, Washington.

PROFESSIONAL EXPERIENCE

March 1995 - present, Supervising Fish and Wildlife Biologist, Oregon Department of Fish and Wildlife.

January 1989 - February, 1995, Research Associate, Aquaculture Research Institute, University of Idaho.

January 1987 - December 1988, Fisheries Biologist II, School of Fisheries, University of Washington.

June 1982 - December 1986, Data Analyst/Biologist, School of Fisheries, University of Washington.

April 1982 - June 1982, Temporary Biologist, Grant County P.U.D., Ephrata, Washington.

March 1980 - March 1982, Senior Library Assistant, Tetra Tech, Inc., Bellevue, Washington.

June 1979 - October 1979, Student Helper V, Fisheries Research Institute, University of Washington, Seattle, Washington.

January 1975 - June 1977, Botanist Student Assistant, Ramapo College, Mahwah, New Jersey.

SPECIAL QUALIFICATIONS AND SKILLS

Operate powerboats

Diverse computer hardware/software/peripherals experience

Certified Scuba Diver

Genetic laboratory analyses (DNA & Protein Electrophoresis)

PROFESSIONAL AFFILIATION

American Fisheries Society

Charles Morrill, Fish Biologist, Washington State Department of Fish and Wildlife

Education:

M.S. in Fisheries, University of Idaho, 1972

B.S. in Wildlife Management, University of Maine, 1969

Current Employment and Responsibilities:

Mr Morrill has over 20 years of professional experience working with Anadromous Salmonids in Washington for the Washington Departments of Fisheries, Wildlife, and now Fish and Wildlife. Since the

early 1980's he has worked on and led a variety of projects within the Columbia Basin including Coded-Wire tag recovery programs, Smolt Monitoring Programs at Lower Monumental and Lower Granite Dam, and for the last three years, the Fish Passage/Facility component of the Cowlitz Falls Anadromous Fish Reintroduction Program.

Currently Mr. Morrill:

Leads and supervises WDFW work at the Cowlitz Falls Fish Facility as part of the Cowlitz Falls Anadromous Fish Reintroduction Program

Supervises WDFW Smolt Monitoring work at Lower Granite Dam (LGR) under the Northwest Power Planning Councils Fish and Wildlife Water Budget Measures Program under the oversight of the Fish Passage Center (FPC).

Supervises WDFW work at Lower Granite Dam as part of the Corps Walla Walla District annual Juvenile Fish Facility Operation Program.

Represents the agency as a technical member on the PIT Tag Steering Committee (PTSC), serves as a co-chair, provides technical direction and guidance for the continued development and use of PIT tags and the PIT tag data base (PTAGIS) within the Columbia Basin. The PTSC is a standing subcommittee under the Fish Passage Advisory Commission (FPAC) and Columbia Fish and Wildlife Authority (CBFWA). The Pacific States Marine Fisheries Commission's (PSMFC) Pit Tag Operations Center (PTOC) handles the day to day management and system operation for system hardware and software.

Represents the agency as technical Co-chair of the PIT Tag Transition Team that is overseeing BPA's project to replace the current 400 KHz PIT Tag system in the Columbia River Basin with a new standard ISO system in time for the year 2000 smolt migration.

Verhey P., Morrill C., Witalis S. and Ross D. 1997 Lower Granite Dam Smolt Monitoring Program. Annual Report. Washington State Department of Fish and Wildlife. DRAFT. Prepared for United States Department of Energy. Bonneville Power Administration. Division of Fish and Wildlife. Project Number 87-127. Contract Number 88-FC38906.

Verhey P., Morrill C. and Ross D. 1996 Lower Granite Dam Smolt Monitoring Program. Annual Report. Washington State Department of Fish and Wildlife. Prepared for United States Department of Energy. Bonneville Power Administration. Division of Fish and Wildlife. Project Number 87-127. Contract Number 88-FC38906. 26 pages

Verhey P., Morrill C. and Goffredo T. 1995 Lower Granite Dam Smolt Monitoring Program. Annual Report. Washington State Department of Fish and Wildlife. DRAFT. Prepared for United States Department of Energy. Bonneville Power Administration. Division of Fish and Wildlife. Project Number 87-127. Contract Number 88-FC38906.

Verhey P., Morrill C., Goffredo T. and Ross D. 1994 Lower Granite Dam Smolt Monitoring Program. Annual Report. Washington State Department of Fish and Wildlife. Prepared for United States Department of Energy. Bonneville Power Administration. Division of Fish and Wildlife. Project Number 87-127.. Contract Number 88-FC38906. 40 pages

Verhey P., Morrill C. and Kuras J. 1993 Lower Granite Dam Smolt Monitoring Program. Annual Report. Washington State Department of Fish and Wildlife. Prepared for United States Department of Energy. Bonneville Power Administration. Division of Fish and Wildlife. Project Number 87-127. Contract Number 88

Edwin Buettner
Senior Fisheries Research Biologist
Idaho Department of Fish and Game
FTE/hours – 2080

Education:

Bachelor of Science, University of Idaho, Moscow, Idaho. General Biology, 1975
Masters of Science, University of Idaho, Moscow, Idaho. Fisheries Resources, 1987

Current Responsibilities:

Program leader for the 'Smolt Monitoring at the Head of Lower Granite Reservoir and Lower Granite Dam' project. Responsibilities include project administration, personnel hiring and supervision, supervision of field operations, equipment maintenance oversight, data analysis, and report preparation. Other duties include IDFG representative to the PIT Tag Steering Committee and to the ISO Transition Planning team.

Recent Previous Employment: Employee of IDFG since 1984.

Expertise:

Operation of smolt traps on large rivers during spring runoff. Also, use of purse seine equipment to capture smolts. Capture, handle and examine large numbers of anadromous smolts and mark with PIT tags, freeze brands and fin clips. Familiar with the PIT tag data repository (PTAGIS) and high degree of knowledge and experience PIT tagging fish.

Recent Publication:

Buettner, E.W. and A. F. Brimmer. 1997. (In Press) Smolt Monitoring at the Head of Lower Granite Reservoir and Lower Granite Dam. Report of Idaho Department of Fish and Game to Bonneville Power Administration, Project 83-323B, Portland, Oregon.

Buettner, E.W. and A. F. Brimmer. 1996. Smolt Monitoring at the Head of Lower Granite Reservoir and Lower Granite Dam. Report of Idaho Department of Fish and Game to Bonneville Power Administration, Project 83-323B, Portland, Oregon.

Buettner, E.W. and A. F. Brimmer. 1995. Smolt Monitoring at the Head of Lower Granite Reservoir and Lower Granite Dam. Report of Idaho Department of Fish and Game to Bonneville Power Administration, Project 83-323B, Portland, Oregon.

Buettner, E.W. and A. F. Brimmer. 1994. Smolt Monitoring at the Head of Lower Granite Reservoir and Lower Granite Dam. Report of Idaho Department of Fish and Game to Bonneville Power Administration, Project 83-323B, Portland, Oregon.

Section 10. Information/technology transfer

All SMP data is transmitted daily to the FPC through the Remote Site Data Entry Program (RSDEP). The data is then reviewed and loaded into a central SQL database at the Fish Passage Center. Several SQL programs are then run to calculate passage indices and prepare reports to load onto the FPC web site. Each day the data and the reports is updated and loaded on to the FPC Website, <http://www.fpc.org>. The FPC Website is easily navigated and updates the following reports.

1. Daily catch report by species for each site for each site.
2. Daily passage indices by species for each site.
3. Daily dissolved gas monitoring at each monitoring site.

4. Water temperature data plots compared to the ten-year average and the past year.
5. Daily average spill and flow for each site.
6. Daily smolt transportation numbers for each transportation site, including cumulative totals.
7. Cumulative passage indices for selected sites compared to the predicted average.
8. Daily adult counts compared to the past year and the ten-year average for each site.
9. System Operations Requests
10. FPC Weekly Reports of operations and Data

Congratulations!