

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

Section 1. General administrative information

Snake River Native Salmonid Assessment

Bonneville project number, if an ongoing project 9800200

Business name of agency, institution or organization requesting funding
Idaho Department of Fish and Game

Business acronym (if appropriate) IDFG

Proposal contact person or principal investigator:

Name	<u>Eric Leitzinger</u>
Mailing Address	<u>600 S. Walnut, P. O. Box 25</u>
City, ST Zip	<u>Boise, ID 83707</u>
Phone	<u>(208) 334-4888</u>
Fax	<u>(208) 334-2114</u>
Email address	<u>eleitzin@idfg.state.id.us</u>

Subcontractors. List one subcontractor per row; to add more rows, press Alt-Insert from within this table

Organization	Mailing Address	City, ST Zip	Contact Name

NPPC Program Measure Number(s) which this project addresses.
10.5B.1

NMFS Biological Opinion Number(s) which this project addresses.

Other planning document references.

If the project type is "Watershed" (see Section 2), reference any demonstrable support from affected agencies, tribes, local watershed groups, and public and/or private landowners, and cite available documentation.

IDFG Fish Management Plan, 1996-2000 (sec 1, sec 2); State of Idaho Bull Trout

Subbasin.

FY 98: Boise River, Payette River subbasins. FY99 and beyond: Boise River, Payette River, Weiser River, Owyhee River, Mid Snake-Powder, Mid Snake-Boise, Mid Snake-Payette, Upper Snake, and Snake Headwaters subbasins. Includes the entire Snake River basin in Idaho from Hells Canyon Dam upstream to the Idaho/Wyoming border.

Short description.

Investigate life histories, habitat needs, stock status, population trends, and threats to persistence/limiting factors of native salmonids (bull trout, redband trout, cutthroat trout, and whitefish) in the Snake River and tributaries upstream of Hells Canyon Dam in Idaho. Identify opportunities for restoration and protection. Develop and implement protection and recovery plans. Monitor the effectiveness of recovery/protection strategies.

Section 2. Key words

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

Other keywords.

Stock identification, life history, limiting factors, habitat, wild native salmonids, protection, restoration, proper functioning ecological/watershed processes

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Coordinate with other ongoing projects and other entities.	a	Conduct literature search to determine where data is lacking, avoid duplicating effort, assist in prioritizing field work, and gain an historical perspective on the salmonid populations in the upper Snake Basin relative to today.
		b	Consult and coordinate with other entities including (but not limited to): IDFG fish managers and fish research, Stream Net, BLM, USFS, BOR (SR3), Shoshone-Bannock Tribes, Shoshone-Pauite Tribes, Idaho DEQ, Basin and Watershed Advisory Groups to assist in prioritizing field work, insure that data is collected in a consistent manner among agencies, avoid duplication of effort etc.
		c	Based on the results of tasks 1 and 2, prioritize and develop a detailed workplan for the 1999 field activities.
2	Assess the current stock status and life history traits of native salmonid populations in the Snake River Basin upstream of Hells Canyon Dam.	a	Use snorkeling and/or electrofishing to estimate current population sizes of salmonids in the highest priority streams (as determined in objective 1).
		b	Identify, describe, and measure habitat characteristics where native salmonids are found, as well as characteristics where they are not found.
		c	Conduct bull trout redd counts and describe habitat characteristics in

			known spawning areas.
3	Determine genetic composition of native salmonid populations.	a	Collect and preserve samples (fin sections) from each population for mitochondrial DNA testing.
		b	Collect tissues (eye, liver, heart, and muscle) from incidental sampling mortalities for starch-gel electrophoresis.
		c	Send samples to lab for analysis.
		d	Interpret results - identify unique and/or pure populations.
4	Compile information into an annual report.	a	Compile and summarize all relevant habitat and fisheries data from other entities.
		b	Summarize and analyze all data for inclusion in annual report. Subtask 3.2.1: Calculate stream or basin wide population estimates for native salmonids. Subtask 3.2.2: Summarize and describe habitat characteristics where native salmonids were found and compare to those habitats where they were absent. Use multivariate techniques to determine the most important habitat characteristics determining native salmonid presence or absence. Subtask 3.2.3 Include genetic data in reports.
		c	Begin identifying potential threats to the long term persistence of native salmonid populations and potential actions to remove those threats. Subtask 3.3.1: Compare habitats where native salmonids were found to those where they were not found.
5	Review progress with the Basin	a	Meet as needed with the

	and Watershed Advisory Groups and other entities to refine methods, redefine scope and direction of the project (if needed), and prioritize activities for 2000.		appropriate entities to review and streamline the project as prioritize 2000 activities.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	01/1998	12/1999	10
2	06/1999	10/1999	50
3	6/1999	10/1999	10
4	10/1999	12/1999	25
5	10/1999	12/1999	5
			TOTAL 100

Schedule constraints.

A potential constraint that may cause schedule changes is the listing of bull trout, redband trout, yellowstone cutthroat trout or any other native aquatic species in the study area on the endangered species list. The listing would probably result in increased coordination and NEPA work.

Completion date.

2015

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel	estimates only	80,000
Fringe benefits	estimates only	30,000
Supplies, materials, non-expendable property	estimates only	20,000
Operations & maintenance	estimates only	15,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	estimates only	55,000

PIT tags	# of tags:	
Travel	estimates only	15,000
Indirect costs	estimates only, 22% of personnel & operating	35,000
Subcontracts		
Other		
TOTAL	estimates only	250,000

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget	250,000	250,000	275,000	275,000
O&M as % of total	6	6	6	6

Section 6. Abstract

Native salmonid populations in the Upper Snake River Basin are depressed and declining. Section 10.5B.1 of the Fish and Wildlife Program calls for the “investigation of the life history, habitat needs and threats to persistence of native salmonids upstream of Hells Canyon Dam...”

This project is a multi-phased restoration project with the overall goal of protecting and restoring native salmonid populations (redband, cutthroat, bull trout) in the Snake River Basin upstream of Hells Canyon Dam in Idaho to self-sustaining, harvestable levels. The project objectives are: 1) Assess stock status and population trends; 2) Identify life history needs, habitat needs, and threats to persistence, limiting factors, and causes for population declines; 3) Develop and implement recovery and protection plans; 4) Monitor effectiveness of recovery and protection actions.

The first phase is an inventory of native salmonid populations to determine present population status and trends. Streams and reservoirs will be inventoried following standard methods (Hankin and Reeves 1988; IDFG’s standard survey protocols; Hamilton and Bergersen 1984; Platts et al. 1983, 1987). Multivariate techniques (e.g. direct gradient analysis, ordination, classification) will be used to relate fish populations to the habitat variables. Fin sections will be collected for genetic analysis.

The second phase of the project will be to identify life history and habitat needs, causes for population declines (limiting factors, threats to persistence), and opportunities for restoration. The third phase will be to develop, implement, and monitor protection and restoration plans. Population changes will be monitored as indicators of success.

Expected outcomes are activities that result in recovery, protection, and long-term

persistence of native salmonids.

Section 7. Project description

a. Technical and/or scientific background.

It has been well documented that aquatic ecosystems, associated riparian habitats, and native fish populations have been severely altered due to human activities since the arrival of European man to the continent . Irrigation development, agriculture, municipalities, channelization, logging, mining, livestock grazing, introduction of exotic fishes, floodplain encroachment, dam building and dam operations have all played a role in negatively impacting the native salmonids (Armour et al. 1991; National Research Council 1992, 1995, 1996; Nehlsen et al. 1991; Sheldon 1988). The upper Snake River basin has been heavily impacted by man since the 1880's when the first major irrigation diversion was built. The first hydroelectric dam was built in 1901 (Swan Falls Dam) (Riggin and Hansen 1992). Now, there are approximately 92 hydroprojects and countless diversions in the Idaho portion of the basin. Anadromous salmonids that used to inhabit the Snake River below Shoshone Falls and all major tributaries have been extirpated primarily due to dam building and hydroelectric development. The loss of anadromous fish habitat and numbers of fish have been quantified by the Northwest Power Planning Council (NPPC) (Northwest Power Planning Council 1986).

Bull trout, redband trout, and yellowstone cutthroat trout distribution, habitat and populations have also been reduced due to the same anthropogenic factors (Leary et al. 1993; Reiman and Apperson 1989; Reiman and McIntyre 1993; USFS 1996; USFS and BLM 1997a; USFS and BLM 1997b). Bull trout were petitioned for listing under the endangered species act (ESA) in 1993. The USFWS determined that listing was warranted but precluded. Bull trout remain a candidate for listing, subject to annual status reviews. Listing is possible within this next year. A petition has been filed recently for listing redband trout under the ESA. Snake River cutthroat trout (finespot and yellowstone) are also depressed (IDFG 1996, USFS 1996, USFS and BLM 1997b). All three species are listed by IDFG (1996) as species of special concern category A (priority species), and by the BLM and USFS as sensitive species. IDFG (1996) defines species of special concern as "native species which are either low in number, limited in distribution, or have suffered significant population reductions due to habitat losses". Category A species are the top priority species.

These species were chosen because These species are an indicator of the overall health of the watershed. Salmonids generally have stricter habitat and water quality requirements than other species. This is especially true of bull trout (Reiman and McIntyre 1993).

In the upper Snake River drainage, quantified data on the status, trends, habitat, life history needs, limiting factors, and threats to existence of these native salmonids is

lacking for most populations. The overall populations of these species are assumed to be depressed and/or declining. This coupled with the fact that there is little or no hard data on specific populations, demonstrates the need to determine the population status and trends of these species throughout the upper Snake River drainage. Work will be focused in the tributaries, namely the Boise, Payette, Owyhee, Weiser, Bruneau, Blackfoot, Wood, Portneuf, upper mainstem Snake River (above Shoshone Falls), Henrys Fork Snake, and South Fork Snake river basins, Salmon Falls and Willow creek basins. Other small tributaries may be included, depending on input from regional fish and land managers.

In order to fully understand these population dynamics, and to adequately manage and recover these populations, we recognize the importance of defining them in terms of their watershed and the proper ecological functioning of these systems as they existed prior to human disturbance. It is imperative to take a historical approach, know and understand the habitats and the biotic and abiotic watershed processes these populations evolved with. We recognize the key to long term persistence of these species is to protect and restore the historical ecological functioning of the watersheds. Most damage to stream systems has come from upslope or offsite, watershed-wide activities. So it is necessary to take a watershed scale approach to restoration (Kauffman et al. 1997).

The key to successful watershed (and fish) restoration will be to develop and interdisciplinary approach using expertise from other fields such as hydrology, geology, ecology, soil science, range and forest science etc. to assist in identifying and understanding proper watershed functions, identifying threats to the watershed, and opportunities for restoration. Restoration strategies will follow those outlined by Frissell (1993). He states that restoration goals should “1) Maintain options for future recovery by ensuring a secure, well-distributed, and diverse constellation of natural habitats and co-adapted populations, and local examples of natural ecosystem processes, remain in place over the long-term; 2) Secure existing populations of aquatic species, including fishes, and maintain the critical areas supporting healthy ecosystem function; 3) Institute recovery measures that stand the greatest chance of producing measurable improvements in the status and abundance of wild fish populations, and improvements of ecosystem function, in the near term.”

The overall goal of the project is to protect and restore native salmonid populations (redband, cutthroat, bull trout) in the Snake River Basin upstream of Hells Canyon Dam in Idaho to self-sustaining, harvestable levels. This project is closely related to several planning documents. The system-wide goal in the NPPC’s Fish and Wildlife Program (FWP) (NPPC 1994, amended 1995) is “a healthy Columbia Basin, one that supports both human settlement and the long-term sustainability of native fish and wildlife species in native habitats...”. The resident fish goal mirrors the system-wide goal by emphasizing the “long-term sustainability of native species in native habitats where possible...”. The goal of the CBFWA draft resident fish multi-year implementation plan is to promote the long-term viability of native species in native habitats (CBFWA 1997). IDFG’s fish management plan (IDFG 1996) states that wild, native, self sustaining fish

populations are a management priority as is protection and restoration of habitats and water quality. One of the goals of the plan is to maintain and restore wild, native fish populations. The project also relates to the State of Idaho's Bull Trout Conservation Plan (State of Idaho 1996). The mission of the plan is to "maintain and/or restore complex interacting groups of bull trout populations throughout their native range in Idaho." The goals of the plan are to "maintain the conditions of those areas presently supporting critical bull trout habitat" and "institute recovery strategies that produce measurable improvement in the status, abundance, and habitats of bull trout."

This project will partially mitigate for fish losses due to the construction and operation of the federal hydropower system in Idaho, namely Anderson Ranch Dam, Boise Diversion Dam, Minidoka Dam, Palisades Dam, and Black Canyon Dam. It will include on-site and off-site mitigation activities.

b. Proposal objectives.

Overall Project Goal: Protect and restore native salmonid populations to self-sustaining harvestable levels in the Snake River and tributaries upstream of Hells Canyon Dam in Idaho.

The overall project objectives are: 1) Assess stock status and population trends; 2) Identify life history needs, habitat needs, and threats to persistence, limiting factors, and causes for population declines; 3) Develop and implement recovery and protection plans; 4) Monitor effectiveness of recovery and protection actions.

Phase I, Year I: Stock Assessment - 1998-2002

Phase I Goal: Determine the current population status and trends in native salmonid populations in the Snake River drainage upstream of Hells Canyon Dam.

Objective 1: Coordinate with other ongoing projects and other entities.

Objective 2: Begin Assessing the current stock status and life history traits of native salmonid populations in the Snake River Basin upstream of Hells Canyon Dam.

Objective 3: Determine genetic composition of native salmonid populations.

Objective 4: Compile information into an annual report.

Objective 5: Review progress with the Basin and Watershed Advisory Groups and other entities to refine methods, redefine scope and direction of the project (if needed), and prioritize activities for 2000.

The products will be the tasks listed in section 7.e. The data generated from this project will be analyzed and summarized in annual and quarterly reports as well as professional presentations.

c. Rationale and significance to Regional Programs.

The overall goal of this project mirrors the goals of the NPPC's FWP, IDFG's Fish Management Plan, CBFWA's MYIP, and Idaho's Bull Trout Conservation Plan. The goal of all these documents is the protection and restoration of native fishes in native habitats. This project will follow a logical sequence of steps designed to protect and recover wild native salmonids. The first step is to determine what the current status of the populations are and what the population trends are. Concurrent with the population inventory will be detailed habitat surveys. This data together with historical information will be used to identify populations and their habitat and life history needs. The second step will be identification of limiting factors and threats to long-term persistence of the populations on both a site-specific and watershed-specific scale. It also includes identifying opportunities for restoration. The third step will be the development of protection and recovery plans designed to restore populations to health, self-sustaining and harvestable levels and to protect existing populations over the long-term.. The fourth step is to implement recovery and protection strategies. The fifth step is to monitor the population responses to these strategies.

The key as far as we see it for maintaining and restoring our wild, native salmonids over the long-term is to protect and restore the natural functioning of the watersheds or ecosystems. Without this, habitat or population restoration activities will probably fail.

There will be coordination with the Bureau of Reclamation (BOR) through their Snake River Resources Review project. We will share information generated from this project. This information will be directly incorporated into the Decision Support System being developed by the by the Snake River Resources Review. Data from other BOR funded projects will be incorporated into this assessment. For example, the BOR is funding bull trout studies in the upper Boise River Basin. Information and equipment (e.g. telemetry gear, fish movement and population size data etc.) will be used by this project. We will also coordinate with the U. S. Forest Service (USFS) and Bureau of Land Management (BLM) on fish habitat surveys. This project will use their data as much as possible to avoid duplicating efforts. The project will coordinate with the U.S. Fish and Wildlife Service (USFWS) and the State's Bull Trout Conservation Plan where bull trout are present. We will work closely with the local Basin and Watershed Advisory Groups to assist in prioritizing, coordinating, and implementing basin wide activities as well as developing and implementing recovery and protection measures. We will also work closely with the Inland Natives Fishes Council to assist in project design and implementation. All activities will be coordinated with Idaho Department of Fish and

Game (IDFG) regional staff, and Indian Tribes where appropriate to minimize equipment purchases and avoid duplicating efforts. The project will also be coordinated with Stream Net staff. Applicable data generated from the project will be made available to the Stream Net project.

Increasing population sizes of weak native fish will have a direct benefit to wildlife by increasing the forage base. Much of the Snake River and tributaries are used as wintering areas for bald eagles. The South Fork of the Snake has the largest black cottonwood riparian forest left in the state of Idaho. It has been identified by the USFWS as a critical area for overwintering eagles. Increasing fish populations would strengthen and increase the wintering bald eagle population in southern Idaho. Populations of other piscivorous birds (mergansers, blue herons, osprey, kingfishers etc.) that live and nest in the Snake River would also benefit.

Part of this project will be to develop biological objectives for management of salmonids in the Snake River basin and they will be submitted to the Council for adoption into the program.

The data and recommendations will be used to develop biological/integrated rule curves. The data will be used to balance the needs of reservoir fisheries and reservoir operations with the needs of weak or threatened native fish in the rivers below the reservoirs and in the reservoirs themselves.

The cutthroat trout in the upper Snake Basin provide an important recreational fishery on the few remaining viable stocks in eastern Idaho. Fishing effort is continuing to rise in eastern Idaho while regulations on native fish have reduced or stopped harvest. For example, IDFG has estimated a total of 30,479 hours were spent fishing on the Teton River in 1975, 31,074 hours in 1988, and 45,246 hours in 1994. The Teton is one of the bodies of water with a relatively healthy, stable cutthroat population. Henry's Lake generated 86,304 hours in 1975, 100,479 hours in 1988, and 177,826 hours in 1994. Total harvest (all species) on Henry's Lake averages between 4 and 5% of the total population with a peak of 9% one year. So, harvest on cutthroat, even where there is a lot of pressure and where there is a healthy population, is minor and may not impact the population. Recovery of weak native stocks would only improve the recreational fishing while reducing the pressure on the existing viable stocks.

Non-target fish populations will also directly benefit from this project. This is an ecosystem approach that will benefit the entire native fish assemblages, not just the target salmonids. Mountain whitefish as well as nongame fish will benefit.

This is a native species project designed to benefit native fish by removing threats to their existence. Nothing in this project will adversely impact native fish. All field activities will follow the established methods described in Platts et al. 1983 and 1987, as well as Hamilton and Bergersen 1984. Snorkeling will be used wherever feasible to estimate populations instead of electrofishing to avoid possible injury or mortality to the fish.

d. Project history

This project is scheduled to begin in FY98. It has not yet begun, so there is no project history. The estimated 1998 costs are \$200,000.

e. Methods.

The tasks associated with the specific objectives listed in section 7.b are listed below.

- Task 1.1: Conduct literature search to determine where data is lacking, avoid duplicating effort, assist in prioritizing field work, and gain an historical perspective on the salmonid populations in the upper Snake Basin relative to today.
- Task 1.2: Consult and coordinate with other entities including (but not limited to): IDFG fish managers and fish research, Stream Net, BLM, USFS, BOR (SR3), Shoshone-Bannock Tribes, Shoshone-Paiute Tribes, Idaho DEQ, Basin and Watershed Advisory Groups to assist in prioritizing field work, insure that data is collected in a consistent manner among agencies, avoid duplication of effort etc.
- Task 1.3: Based on the results of tasks 1 and 2, prioritize and develop a detailed workplan for the 1998 field activities.
- Task 2.1: Use snorkeling and/or electrofishing to estimate current population sizes of salmonids in the highest priority streams (as determined in objective 1).
- Task 2.2: Identify, describe, and measure habitat characteristics where native salmonids are found, as well as characteristics where they are not found.
- Task 2.3: Conduct bull trout redd counts and describe habitat characteristics in known spawning areas.
- Task 3.1 Collect and preserve samples (fin sections) from each population for mitochondrial DNA testing.
- Task 3.2 Collect tissues (eye, liver, heart, and muscle) from incidental sampling mortalities for starch gel electrophoresis.

- Task 3.3 Send samples to lab for analysis.

- Task 3.4 Interpret results - identify unique and/or pure populations.
- Task 4.1: Compile and summarize all relevant habitat and fisheries data from other entities.

- Task 4.2: Summarize and analyze all data for inclusion in annual report.
 - Subtask 4.2.1: Calculate stream or basin-wide population estimates for native salmonids.
 - Subtask 4.2.2: Summarize and describe habitat characteristics (including spawning habitat) where native salmonids were found and compare to those habitats where they were absent. Use multivariate techniques to determine the most important habitat characteristics determining native salmonid presence or absence.
 - Subtask 4.2.3 Summarize bull trout redd counts and estimate potential fry production.

- Task 4.3: Begin identifying potential threats to the long term persistence of native salmonid populations and potential actions to remove those threats.
 - Subtask 4.3.1: Compare habitats where native salmonids were found to those where they were not found.

- Task 5.1 Meet as needed with the appropriate entities to review and streamline the project as prioritize 2000 activities.

Streams will be inventoried following the methods described by Hankin and Reeves (1988). IDFG's standardized stream and lake survey protocols will also be followed and these data will be considered the minimum set of data to be collected. Additional data may also be collected. Exactly what is collected will depend on the coordination among the various agencies involved. Although the focus is on native salmonids, all species observed will be recorded in a similar manner. Habitat measurements will follow the guidelines of Hamilton and Bergersen (1984), Platts et al. (1983), and Platts et al. (1987). Multivariate techniques such as direct gradient analysis, ordination (e.g. detrended correspondence analysis), and classification (e.g. hierarchical) as described by Gauch (1982) will be used to relate the fish present to the habitat variables. These techniques help determine which habitat features have the greatest influence on the fish present.

Genetic sampling and analysis using mitochondrial DNA will follow the protocols established by Setter and Branon (1994) and Branon et al. (1994). Non-lethal methods will be used to collect the samples. Fish will be collected while conducting the fish population and habitat field work. Electrofishing gear, seines, and/or traps will be used to

collect the fish. Small sections of the caudal and/or adipose fin will be collected and the fish returned to the area of capture. The samples will be sent to a lab at the University of Idaho for analysis as soon as possible after collection. If the genetic baselines have not been established for these native salmonids, the samples will be archived until the baselines have been completed. In the meantime, tissue samples (eye, liver, heart, and muscle) will be collected from incidental sampling mortalities for starch-gel electrophoresis. We will follow the protocols described by Waples et al. (1997) for collecting, storing, and shipping the samples. The samples will be sent to a lab (e.g. the National Marine Fisheries Service lab in Seattle, the Washington Department of Fish and Wildlife lab in Olympia, University of Washington, etc.) for analysis. The genetics work will help identify unique and pure (no hatchery introgression) populations for protection and recovery.

We are assuming that habitat degradation and fragmentation (especially due to hydropower development) are the primary causes of population decline and are still major threats to the long-term existence of wild, native salmonids in the upper Snake Basin in Idaho. We are assuming that recovery of these weak, native stocks to self-sustaining harvestable levels is possible. We are also assuming that there are some relatively healthy populations in good to excellent habitat that can move and reestablish populations in restored habitat. These populations and habitats can be used as examples to guide restoration activities and to establish goals for population size, density, age structure etc. and habitat quantity and quality.

Final results will be measured by monitoring population responses to the implementation of recovery and protection strategies. We are expecting statistically significant increases in populations in response to recovery efforts, to the point where they could sustain some level of harvest. If efforts are completely successful, we anticipate that populations of ESA listed species may be delisted.

f. Facilities and equipment.

Project personnel will be working out of the IDFG resident fish hatchery in Nampa, Idaho. This facility currently houses the southern Idaho Resident Fish Research Program. There is office and storage space available free of charge. It is across the street from the anadromous fish research office.

The project plans to lease a 3/4 ton 4x4 GMC suburban as a field vehicle for the 1998 field season. The plans are to purchase a vehicle for 1999. A mobile radio will be installed for safety and needed communication in the back country. Major field equipment purchases include a screw trap to monitor movement of juveniles and adults out of spawning and rearing areas, a flatbed trailer to carry the trap, a camp trailer (with a portable gas generator) to house personnel on-site during the trapping seasons (fall and spring), a GPS unit to map and identify locations of sample areas, spawning grounds,

redds, suitable and unsuitable habitat etc. We also plan on purchasing at least one backpack electrofishing unit for sampling in streams where snorkeling isn't feasible, continuous recording HOBO temperature monitors, camera to photograph study areas and habitats. All necessary office furniture and a new computer will be purchased for the project biologist. This will be connected to IDFG's network so all the software will be available for summarizing and analyzing data. There will also be internet access. There is a considerable amount of other equipment within IDFG which is available to this project if needed. The Department can also provide volunteer workers, administrative and computer help, storage space, and expertise on many subjects.

g. References.

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Section 8. Relationships to other projects

This project is related to several ongoing and proposed projects in the upper Snake River Basin. The existing Idaho Water Rental Project (BPA project 91-067) is designed to

9800200 Snake River Native Salmonid Assessment

quantify the impacts of the salmon flow augmentation water released from the upper Snake River Basin on resident fish upstream from Brownlee Reservoir. The project looks at habitat versus flow relationships for several native species and has made recommendations on the release of the flow augmentation water to benefit resident fish. This information will serve as a starting point for identifying life history and habitat needs as well as opportunities for restoration.

The BOR is currently funding IDFG to conduct bull trout life history and habitat work in the upper Boise River Basin. Data from the BOR project will be directly integrated into this project. It will be used in our analyses and become part of our database. The BOR study will allow this project to work in watersheds not scheduled until the second and third years of the project. It will save considerable dollars over the life of the project and allow more concentrated efforts in other basins.

The BOR is also conducting a project called the Snake River Resources Review (SR3). The SR3 is building a decision support system (DSS) to improve the overall water management of the upper Snake River subregion (upstream of Brownlee Dam). The DSS will allow managers to make better informed decisions on water management in the Upper Snake Basin. They will be able to see and analyze the trade-offs (benefits and risks) of different management (water release) strategies. Information from the salmonid assessment project will be (e.g. habitat and flow requirements, threats to persistence, limiting factors etc.) Will be incorporated directly into the DSS so that impacts (positive and negative) to native resident fisheries from various flow scenarios can be evaluated.

The proposed project: Genetic Analysis of Snake River Native Salmonids (BPA project # 5501900) is a sister project. It was meant for these project to occur simultaneously. The genetic information derived from this project will be used to help identify unique and pure wild native salmonid stocks in the upper Snake River Basin for protection and restoration.

The proposed Resident Fish Loss Assessment (BPA project 9501400) would provide estimates as to the size of native salmonid populations and some life history and habitat use prior to development by European man. This information would provide a valuable historic view. It would also provide a goal for mitigation activities.. Our goal would be to recover populations to as close to their historic size as possible.

Section 9. Key personnel

The project biologist has not yet been hired.

Section 10. Information/technology transfer

Information from this project will be shared through the coordination with the BOR through their SR3 project and bull trout studies. This information will be directly incorporated into the Decision Support System being developed by the by the SR3. Data from the bull trout studies will be incorporated into this assessment. Information and equipment (e.g. telemetry gear, fish movement and population size data etc.) will be used by this project. We will also coordinate and share information with the U. S. Forest Service (USFS) and Bureau of Land Management (BLM) on fish habitat surveys. We will work closely and share information with the local Basin and Watershed Advisory Groups to assist in prioritizing, coordinating, and implementing basin wide activities as well as developing and implementing recovery and protection measures. We will also work closely with the Inland Natives Fishes Council to assist in project design and implementation. All activities will be coordinated with Idaho Department of Fish and Game (IDFG) regional staff, and Indian Tribes where appropriate. Findings will be presented at project review meetings held by BPA, when they occur. The project will also be coordinated with Stream Net staff. Applicable data generated from the project will be made available to the Stream Net project and all Stream Net users. All data will become part of IDFG's common databases. Information will also be shared through quarterly and annual reports, and presentations at professional society meetings. Information may also be put on IDFG's home page on the internet.