

**Bonneville Power Administration
Fish and Wildlife Program FY98 Proposal Form**

Section 1. General administrative information

Title **ASSESS FISH HABITAT AND SALMONIDS
IN THE WALLA WALLA WATERSHED IN
WASHINGTON**

Bonneville project number, if an ongoing project 8016

Business name of agency, institution or organization requesting funding

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Business acronym (if appropriate) WDFW

Proposal contact person or principal investigator:

Name	<u>Glen Mendel</u>
Mailing Address	<u>401 S. Cottonwood St.</u>
City, ST Zip	<u>Dayton, WA 99328</u>
Phone	<u>(509) 382-1005</u>
Fax	<u>(509) 382-2427</u>
Email address	<u>snakeriv@dfw.wa.gov</u>

Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
WA DOE	N. 4061 Monroe St. suite 202	Spokane, WA 99205-1295	John Covert

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

7.0C.1, 7.1C.3, 7.2, 7.3, 7.3B.1, 7.4A, 7.4B, 7.4L, 7.6, 7.6C, 7.8G, 10.5A

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

NOT AVAILABLE FOR THE WALLA WALLA WATERSHED

Other planning document references.

- A) Pages in WY KAN USH ME WA KUSH WIT, related particularly to page 54, items 1b, 1c, 2, 3, 5, 8
 - B) Associated with NE OREGON HATCHERY PROJECT - UMATILLA H. SUPPLEMENTAL MASTER PLAN, and the WALLA WALLA INVESTIGATIVE REPORT NO. 1- DEC. 1993.
 - C) This proposal would update the Watershed Assessment portion in the WALLA WALLA SUBBASIN PLAN, 1989
 - D) Pages 16 & 17 of the COLUMBIA RIVER BASIN FISH AND WILDLIFE PROGRAM, FY 1998 - ANNUAL IMPLEMENTATION WORK PLAN (OCT 1997). Also on Page 63 of the WALLA WALLA SUBBASIN SECTION of this same Work Plan,
 - E) Section III.B.11 recommendation for watershed assessment to precede implementation of restoration projects - in REPORT OF THE INDEPENDENT SCIENTIFIC REVIEW PANEL (ISRP REPORT 97-1, JULY 1997)
-

Subbasin.

WALLA WALLA (INCLUDES MILL CREEK AND TOUCHET RIVER AND TRIBUTARIES)

Short description.

TO DETERMINE FISH PASSAGE, REARING, AND SPAWNING CONDITIONS FOR STEELHEAD AND POTENTIAL REINTRODUCTION OF SALMON, AND TO ASSESS STEELHEAD AND BULL TROUT DISTRIBUTION, DENSITIES, AND GENETIC COMPOSITION IN THE WALLA WALLA WATERSHED.

Section 2. Key words

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

Other keywords.

HABITAT ASSESSMENT, SALMONID POPULATION ASSESSMENT & DISTRIBUTION

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
9606400	Walla Walla Watershed Enhancement	WDFW proposed project updates the habitat assessment and could help guide what habitat enhancement is needed and where
9601200	Adult Anadromous Fish Passage Improvement at Irrigation Diversion Dams on the Walla Walla	WDFW proposed project updates the habitat assessment and would help identify low flow locations and passage problems for adult salmon and steelhead and may help guide passage improvement actions.
8805302	Walla Walla Master Plan (draft) 1993, as part of the NE Oregon Hatchery Program (NEOH)	The WDFW proposed project would provide current data that are needed concerning 1) low flows and summer temperature passage problems, 2) potential rearing and spawning habitat available for reintroduction of spring chinook and other salmon, 3) the steelhead and bull trout stocks present, and 4) the distribution and abundance of steelhead and bull trout for adequate planning and implementation of this Master Plan.
9604600	Riparian and Fish habitat Analysis, Protection, and Enhancement to increase natural production of spring chinook and steelhead.	The WDFW proposal has been coordinated with the CTUIR and supplements their project. It increases the fish habitat evaluation portion and could guide habitat protection and enhancement efforts.

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2, 3	Objective	Task a,b,c	Task
1	Assess habitat conditions for anadromous and resident salmonids in the Washington portion of the Walla Walla Watershed	a	Establish 4-5 constant recording stream discharge monitors in the lower Walla Walla River, Touchet River and possibly lower Mill Creek to identify available water for salmonid passage and rearing during April or May through October.
		b	Conduct periodic stream discharge measurements to calibrate constant recording discharge monitors and at other sites to provide information on water discharge available for salmonid passage and rearing.
		c	Conduct periodic flights of the lower Walla Walla and Touchet rivers to determine continuity of stream flows for adequate fish passage and rearing.
		d	Deploy constant recording water temperature monitors at various sites in the Walla Walla, Touchet, and Mill Creek to determine temperature limitations for salmonid passage, rearing or spawning (April-October).
		e	Periodically collect water quality data (eg. Dissolved oxygen) to determine suitability for salmonids
		f	Conduct general habitat surveys in portions of the stream with potential for salmonid use to quantify habitat conditions
		g	Begin planning for potentially conducting an Instream Flow Incremental Methodology (IFIM)

			Study of the lower mainstem Walla Walla River to determine recommended flows needed for fish passage and rearing. The possible IFIM Study would be conducted in 1999 or 2000.
2	Determine salmonid distribution, habitat use and relative abundance in the Washington portion of the Walla Walla watershed.	a	Conduct steelhead and bull trout spawning surveys.
		b	Conduct electrofishing or snorkel surveys during summer to determine salmonid rearing distribution and densities and habitat use.
3	Identify genetic stocks of steelhead and bull trout in the Walla Walla Watershed.	a	At existing adult steelhead trap sites in Oregon (Nursery Dam) and Washington (Yellowhawk Creek and Touchet River) collect up to 100 fin clips each from adult steelhead and bull trout for DNA analysis.
		b	Collect fin clips from juvenile steelhead and bull trout during electrofishing for salmonid distribution and density surveys for DNA analysis to supplement adult collections, if necessary.
		c	Conduct DNA analysis at the WDFW genetics laboratory and compare with other genetic analyses for nearby populations to identify steelhead and bull trout stocks.
		d	Use the genetic stock identification information to plan for development of local steelhead broodstocks for hatchery production in the Walla Walla Watershed.
4	Compile and disseminate results and conclusions for watershed restoration planning.	a	Annually distribute written data summaries and complete a final written report for distribution

		b	Report results orally to various organizations
--	--	---	--

Objective schedules and costs.

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	04/1998	11/2000	55
2	04/1998	11/2000	31
3	04/1998	11/2000	10
4	04/1998	08/2001	4

Schedule constraints.

ESA listings of bull trout and/or steelhead may delay scheduled activities until ESA permits are obtained, or listings may require modifications to proposed actions to reduce potential impacts to listed species. High flows in area streams may require delay of monitoring devices until flows subside in May or June.

Completion date. FINAL REPORT COMPLETION IN 2001.

Section 5. Budget
FY98 budget by line item

Item	Note	FY98
Personnel		60,166
Fringe benefits		17,147
Supplies, materials, non-expendable property		22,350
Operations & maintenance		1,000
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Computer, printer, software, 5 flow dataloggers, 2 dry suits, 12 temp. Monitors and software, electronic balance	13,675
PIT tags	# of tags:	0
Travel	\$80/day x 8 days	640
Indirect costs	at 19.5%	20,193
Subcontracts	WA DOE for flow monitor set-up & operation	3,520
Other		0
TOTAL		138,691

Outyear costs.

Outyear costs	FY1999	FY2000	FY01	FY02
Total budget	137,000	138,000	20,000	0
O&M as % of total	0.7	0.7	2.5	0

Section 6. Abstract

Fish habitat in streams within the Walla Walla watershed of southeast Washington and northeast Oregon has been severely degraded by urban and domestic development, farming, grazing, logging, recreational activities, floods and flood control efforts.

Historically, the Walla Walla basin produced substantial runs of both spring chinook and summer steelhead. Chum and coho were likely also present. Salmon have been absent from the basin since approximately the 1920's due to irrigation dams, extensive water withdrawals and habitat degradation (CTUIR 1989). Native steelhead runs have also declined. Steelhead and bull trout in the Walla Walla watershed are candidate species or proposed for listing, respectively, under the Endangered Species Act (ESA).

The Northwest Power Planning Council Fish and Wildlife Program (NPPC 1995) calls for regular updating of subbasin plans (7.0C) and collection of population status, life history and other data on wild and naturally spawning populations (7.1C and 7.1C.3), which includes bull trout (10.5A). It also calls for improved hatchery production, or developing new hatchery supplementation programs, while proceeding with extreme caution to avoid damaging remaining wild and naturally spawning populations (7.2). The Fish and Wildlife Program (FWP) recommends developing, implementing and evaluating supplementation plans and risk assessments (7.3, 7.3B.1, 7.4A). It also requires writing a hatchery production Master Plan (7.4B, 7.4L) that includes identification of factors limiting production and setting project goals and objectives. A watershed assessment and coordination of habitat planning efforts is recommended (7.6C). The FWP also states that instream flow needs should be established and protected (7.8G). The Independent Scientific Review Panel (ISRP 1997) and the NPPC (1997) recommended that watershed assessments precede implementation of restoration projects (III.B.11).

The NPPC has funded several projects in the Walla Walla basin (9601100, 9601200, 9604600, 8805302) with the Confederated Tribes of the Umatilla Reservation (CTUIR), and the Walla Walla Conservation District (9606400). Additional aquatic resource efforts are underway in the basin by Corps of Engineers (COE) for resource planning and environmental restoration (COE 1997, COE 1992) and by a citizen watershed council in Oregon (BOR 1997). A Subbasin Plan (CTUIR 1989) and a draft hatchery production Master Plan (CTUIR 1993) have also been compiled for the watershed. All these efforts in the Walla Walla watershed are for planning or implementing watershed and fish stock restoration programs.

The WDFW is proposing to conduct a watershed habitat and salmonid fish stock assessment in the portion of the Walla Walla Basin within Washington State. The project would assess the habitat conditions (particularly stream flows and water temperatures) that affect steelhead and bull trout use and passage in the lower portion of the basin, as well as the potential for adult and juvenile passage should spring chinook or other salmon species be reintroduced. Habitat and fish stock assessment in the rest of the watershed within Washington would evaluate the amount of potential rearing and spawning habitat available if salmon are reintroduced in the future, and habitat conditions, habitat use, distribution, abundance and genetic stock identification for existing natural populations of steelhead and bull trout. The specific objectives are as follows:

1. Assess habitat conditions for anadromous and resident salmonids in the Washington portion of the Walla Walla watershed.
2. Determine salmonid distribution and relative abundance in the Washington portion of the Walla Walla watershed.
3. Identify genetic stocks for steelhead and bull trout in the Walla Walla watershed (including part of Oregon).
4. Compile and disseminate results and conclusions for watershed restoration planning.

Methods proposed for this study include habitat and fish components. A series of fixed monitoring sites for measurement of stream discharge and spring and summer water temperatures. Additional measurements will be taken periodically at other locations. A general habitat survey will be conducted at selected sites throughout the basin to determine the number and quality of pools and cover as well as quantification of other habitat measures. Data collection for the distribution and abundance of salmonids will include steelhead and bull trout spawning surveys and electrofishing or snorkeling for juvenile fish during the summer. Genetic stock identification for natural and wild steelhead and bull trout will consist of taking samples of tissue from fin clips at various existing adult trap sites, or from juvenile during electrofishing surveys, using a DNA sequencer, and analyzing allele frequencies and comparing with other populations.

The information proposed for collection is critical for planning and implementing watershed restoration, resource management for sensitive and depressed salmonid populations, as well as for planning hatchery supplementation or continuing hatchery mitigation for steelhead, or for reintroduction of spring chinook salmon in the Walla Walla basin. Some results would be available within one year, and the final project report would be available in 2001. Annual summaries and coordination with CTUIR, ODFW, COE, WDOE and the Walla Walla and Columbia Conservation Districts, as well as others, would receive high priority.

Section 7. Project description

a. Technical and/or scientific background.

The Walla Walla watershed is located in southeast Washington and northeast Oregon. The total area of the watershed is 1,758 square miles, of which 73% (1,275 square miles) are in Washington (COE 1992, 1997). The primary physiographic features of the basin are the steep, lightly timbered Blue Mountains in the southeast, the rolling foothills and Palouse Prairie throughout much of the landscape and the Walla Walla and Touchet river valleys. The main streams in the Basin include Mill Creek, the Touchet River and the Walla River, plus several smaller tributaries. Approximately 15% of the basin is forest lands and 82% is used for cropland and grazing. Over 90% of the area is privately owned lands.

Fish habitat in area streams has been severely degraded by urban and domestic development, farming, grazing, logging, recreational activities, floods and flood control efforts. Sixty percent of current water usage in the basin is for irrigating crops (COE 1997) and irrigation has severely impacted stream flows in the Walla Walla River since the 1880's (Nielson 1950). Historically, the basin produced substantial runs of both spring chinook and summer steelhead. Chum and coho were likely also present. Salmon have been absent from the basin since approximately the 1920's due to irrigation dams, extensive water withdrawals and habitat degradation (CTUIR 1989). Native steelhead runs have also declined. Steelhead and bull trout in the Walla Walla watershed are candidate species or proposed for listing, respectively, under the Endangered Species Act (ESA). Further decisions concerning ESA listings of these two species in the Walla Walla Basin are expected in 1998.

Fish management efforts in the Washington portion of the Walla Walla watershed are focused on protection and restoration of dwindling naturally produced steelhead and bull trout, implementation of a large mitigation program for steelhead and resident trout under the Lower Snake River Compensation Plan (LSRCP), and providing recreational fishing opportunities. Primary threats to fish resources include hydroelectric dams and associated reservoirs in the Columbia River, out-of-basin harvest, loss of riparian habitat, loss of instream water, and detrimental changes in hydrology, sediment transport, stream channel stability and summer water temperatures because of land use activities such as logging, agriculture, irrigation and urban water withdrawals, and road construction.

The Walla Walla Subbasin Plan, written nearly ten years ago (CTUIR 1989), and the draft Walla Walla Master Plan (CTUIR 1993) which was based on the Subbasin Plan, recommend using hatcheries for supplementing steelhead and reintroduction of spring chinook salmon in the Walla Walla watershed. The Northwest Power Planning Council Fish and Wildlife Program (NPPC 1995) calls for regular updating of subbasin plans (7.0C) and collection of population status, life history and other data on wild and naturally spawning populations (7.1C and 7.1C.3), which includes bull trout (10.5A). It also calls for improved hatchery production, or developing new hatchery supplementation programs, while proceeding with extreme caution to avoid damaging remaining wild and naturally spawning populations (7.2). The Fish and Wildlife Program (FWP) recommends

developing, implementing and evaluating supplementation plans and risk assessments (7.3, 7.3B.1, 7.4A). It also requires writing a hatchery production Master Plan (7.4B, 7.4L) that includes identification of factors limiting production and setting project goals and objectives. A watershed assessment and coordination of habitat planning efforts is recommended (7.6C). The FWP also states that instream flow needs should be established and protected (7.8G). The Independent Scientific Review Panel (ISRP 1997) recently recommended that watershed assessments precede implementation of restoration projects (III.B.11). The NPPC in its Annual Implementation Work Plan for Fiscal Year 1998 (NPPC 1997) concurred with the ISRP's recommendation that watershed assessments that describe habitat conditions, as well as needs and opportunities for habitat restoration for fish stocks inventoried in that watershed, precede implementation of restoration activities.

The NPPC has approved and funded several projects in the Walla Walla basin (9601100, 9601200, 9604600, 8805302) with the Confederated Tribes of the Umatilla Reservation (CTUIR), and the Walla Walla Conservation District (9606400). Additional aquatic resource efforts are underway in the basin by Corps of Engineers (COE) for resource planning and environmental restoration (COE 1992, COE 1997) and by a citizen watershed council in Oregon (BOR 1997). A Subbasin Plan (CTUIR 1989) and a draft hatchery production Master Plan (CTUIR 1993) have also been compiled for the watershed. The U.S. Forest Service (USFS) is conducting spawning surveys and a radio telemetry study in the basing. All these efforts in the Walla Walla watershed are for planning or implementing watershed and fish stock restoration programs or protecting wild salmonids.

The existing resource planning efforts for the Walla Walla basin each provide new information and complement one another, but they all tend to use much of the same limited data for fish habitat conditions and salmonid distribution and abundance. For example, it is common knowledge that portions of the Walla Walla and Touchet rivers are dry or very warm in spring and summer because of irrigation withdrawals. These low flows and high stream temperatures likely affect salmonid passage, use, or survival in the lower rivers but the extent and duration of these problems have not be quantified. Also, current information on salmonid distribution, habitat use, abundance and stock identification are generally lacking. Additional field data are necessary to adequately plan for watershed habitat and salmonid stock restoration. These data should include detailed field measurements of water availability and temperatures for fish passage, rearing and spawning, as well as other measures of habitat condition. They should also include field verification concerning salmonid distribution, abundance, and genetic stock identification. These data needs are key elements necessary for watershed and fish stock restoration planning and implementation in the basin.

The Washington Department of Fish and Wildlife has been actively involved for many years with fish habitat and salmonid stock assessment activities in the nearby Tucannon River and Asotin Creek as part of model watershed programs (Asotin Conservation District 1994, Columbia Conservation District 1997), LSRCP hatchery monitoring and evaluation, and stream flow studies of the Tucannon River. The WDFW has coordinated

with the CTUIR, COE, Washington Department of Ecology (WDOE) and the Oregon Department of Fish and Wildlife (ODFW) regarding this proposal. All entities have indicated support and are intending to cooperate with this proposed project. The proposed WDFW project would supplement efforts by all other organizations by providing detailed, quantifiable salmonid habitat and population data for much of the basin that are necessary for adequate resource planning and restoration efforts in the Walla Walla Basin. The WDFW has the expertise for the proposed data collection and summarization for fish habitat and fish stocks in the basin. Genetic stock identification information collected from portions of the Walla Walla Basin in Oregon and Washington would supplement current WDFW efforts (Busack and Shaklee 1995) to identify salmonid stocks for local and State management as well as for more regional ESA considerations. Genetics samples, data and analyses would be available to ODFW, CTUIR, the National Marine Fisheries Service (NMFS) and the U. S. Fish and Wildlife Service (FWS) and other interested parties. Flow and temperature data proposed to be collected for the lower portions of the Walla Walla and Touchet rivers would be of substantial importance to several other resource planning efforts and organizations (eg. WDOE, COE, CTUIR, ODFW, Walla Walla Watershed Council in Oregon, American Rivers, etc.). John Covert (WDOE) and Dr. Hal Beecher (WDFW) have much experience with stream flow monitoring and use of the Instream Flow Incremental Methodology to determine fish habitat needs and recommend flows for salmonids, respectively. Similar flow studies were conducted by these individuals in the Tucannon River in the past three years (eg. Covert et al. 1994). The proposed temperature monitoring, habitat and fish stock assessment are similar to activities conducted by WDFW in the Tucannon River (Mendel et al. 1993). Glen Mendel (WDFW) has been actively involved in salmonid and habitat monitoring projects in southeast Washington as part of the LSRCP for many years, and is currently also involved in fish management and fishery coordination for this area.

b. Proposal objectives.

The WDFW is proposing to conduct a watershed habitat and salmonid fish stock assessment in the portion of the Walla Walla Basin within Washington State. The project would assess the habitat conditions (particularly stream flows and water temperatures) that affect steelhead and bull trout use and passage in the lower portion of the basin, as well as the potential for adult and juvenile passage should spring chinook or other salmon species be reintroduced. Habitat and fish stock assessment in the rest of the watershed within Washington would evaluate the amount of potential rearing and spawning habitat available if salmon are reintroduced in the future, and habitat conditions, habitat use, distribution, abundance and genetic stock identification for existing natural populations of steelhead and bull trout. The specific objectives are as follows:

1. Assess habitat conditions for anadromous and resident salmonids in the Washington portion of the Walla Walla watershed.
2. Determine salmonid distribution and relative abundance in the Washington portion of the Walla Walla watershed.

3. Identify genetic stocks for steelhead and bull trout in the Walla Walla watershed (including part of Oregon).
4. Compile and disseminate results and conclusions for watershed restoration planning.

c. Rationale and significance to Regional Programs.

The work proposed by the WDFW would provide detailed habitat and fish stock information in the Walla Walla basin that should help guide all FWP approved projects for improving fish passage or habitat (9606400, 9601100, 9601200, 9604600) and hatchery production planning (8805302) as well as resource planning efforts by the COE (COE 1992, 1997) other organizations (Walla Walla Watershed Council in Oregon 1997, etc). Although the CTUIR project for riparian and fish habitat analysis, protection and enhancement...(9604600) appears from its title to conflict or duplicate actions proposed by the WDFW project, there is no duplication or conflict. Their fish habitat analysis is specific to sites that receive riparian habitat enhancement activities as part of their project, while our proposed fish habitat assessment is to evaluate habitat conditions for much of the basin for overall watershed planning. The WDFW has discussed coordination with the CTUIR and we both see opportunities for mutual assistance and benefits to resource planning in the basin (Jed Volkman, CTUIR, personal communication).

The proposed project would address the goals of the FWP and other efforts as indicated below for each numbered objective.

Objective 1: Assess habitat conditions ...

Limited stream flow and temperature data have been compiled in recent reports for the Walla Walla River (Zimmerman 1993, COE 1992, COE 1997). Zimmerman (1993) collected some new stream temperature data from one site near the mouth of the river. He concentrated on the likely effects of temperatures and flows on potential reintroduction of spring chinook salmon but he did not evaluate their effects on existing natural steelhead and bull trout populations in the watershed that may become listed under ESA in the near future. These documents do not assess the amount or condition of salmonid fish habitat in the watershed for rearing and spawning. The draft Walla Walla Master Plan (CTUIR 1993) listed estimates of suitable salmonid habitat in the basin as documented in the Walla Walla Subbasin Plan (CTUIR 1989). These estimates were best guesses in 1998 by Mark Schuck and Glen Mendel of WDFW, and Gary James (CTUIR), and were based on general familiarity with the area streams. They have not been verified by field habitat measurements. The proposed WDFW project would obtain the necessary field data to evaluate those estimates and develop of the final Master Plan for hatchery production (7.4B, 7.4L). This is consistent with the FWP (NPPC 1995) which calls for regularly updating the Subbasin Plan (7.0C). The Independent Scientific Review Panel (ISRP 1997) recently recommended that watershed assessments precede implementation of restoration projects (III.B.11). The NPPC (NPPC 1997) later concurred with the ISRP's recommendation that watershed assessments precede implementation of restoration activities. A watershed assessment and coordination of habitat planning efforts is recommended in the FWP (7.6C). The FWP also states that instream flow needs should

be established and protected (7.8G). The proposed project would determine instream flow needs if an IFIM study is conducted.

Objective 2: Determine salmonid distribution and relative abundance...

Little is known about salmonid distribution and abundance in the watershed. Steelhead spawning ground surveys have not been conducted, nor has juvenile salmonid sampling been conducted for many areas of the basin. The proposed activities would greatly increase our knowledge for planning and management and they are specially called for in the FWP for regularly updating the Subbasin Plans (7.0C), development of the hatchery production Master Plan (7.4B, 7.4L), and collection of population status, life history and other data on wild and naturally spawning populations (7.1C and 7.1C.3, 10.5A). It enables the fishery managers to adequately plan for hatchery enhancement while protecting naturally produced salmonids (7.2, 7.3, 7.3B, 7.4A) and remain consistent with potential ESA requirements and the WDFW wild salmonid policy.

Objective 3. Identify genetic stocks for steelhead and bull trout ...

Currently, the LSRCF hatchery program is using Wells stock steelhead for mitigation in the Walla Walla River basin. This stock is now inconsistent with the WDFW wild salmonid policy, and potential ESA requirements should listings occur that include salmonids within the watershed. This stock is also inconsistent with the draft hatchery Master Plan (CTUIR 1993) and ODFW's wild fish management plan for the Walla Walla River. The number of separate natural steelhead and bull trout stocks in the Walla Walla basin are currently unknown so we can not effectively determine the best approach to development one (or multiple) local hatchery broodstock(s) for steelhead mitigation or supplementation and for protection of wild stocks. Collection of genetics data as proposed by WDFW is consistent with the FWP for updating Subbasin Plans (7.0C), collecting information about population status of wild populations (7.1C, &.1C3, 10.5A), and developing hatchery Master Plans and hatchery programs (7.2, 7.3, 7.3B, 7.4A, 7.4B, 7.4L). It also assists with management decisions associated with wild fish policies and potential listing under ESA.

Objective 4: Compile and disseminate results and conclusions for watershed restoration planning. Summaries of results and conclusions will greatly benefit salmonid habitat and fish stock restoration planning and implementation and management decisions as indicated for the first three objectives.

The WDFW has arranged for assistance from WDOE for stream flow monitoring and coordinated the proposed activities with the CTUIR, ODFW and the COE. Ample opportunity exists for assisting each other in data collection, watershed planning and implementation of restoration activities. Coordination and cooperation will be a high priority.

d. Project history (for continuing projects).

Not Applicable

e. Methods.

Tasks 1a-c. WDOE will establish several stream flow monitoring devices to continually record stream discharges from April or May through October. The monitors will be established at various sites in the Walla Walla and Touchet rivers to supplement the one USGS gauge station in the lower Walla Walla River. Periodic stream flow measurements will be made at transects with a Swiffer portable velocity meter to determine discharge and calibrate the monitoring stations. Additional stream flow measurements will be periodically made at additional sites to supplement the fixed-site monitors. Approximately two flights per month will be made with a Cessna 182 fixed wing aircraft during May-October to determine continuity of water flow in the river channels in the lower Walla Walla and the Touchet rivers. A video camera may be used to document results of the flights.

Task 1d. WDFW will deploy up to 12 constant recording temperature monitors to record water temperatures each hour from May through October. These monitors will be distributed along several streams in the basin to aid in determination of available habitat and passage conditions for salmonids.

Task 1e. Periodic water quality sampling will include dissolved oxygen levels (DO) and percent oxygen saturation in the lower Touchet and Walla Walla rivers when discharge or temperature monitors are downloaded, and at other times and locations. A titration method using a Hach kit will be used for DO determination.

Task 1f. General habitat surveys will be conducted in selected reaches of the streams to determine fish habitat conditions. Number and area of pools, pool quality, thalweg velocities, and other habitat measures will be collected in many different reaches of area streams. The specific survey method has not been determined at this time. A method modified from Hankin and Reeves (1988), or use of a method that uses other standard habitat metrics will be employed. Final selection of a survey method will be made in the spring of 1998.

Task 1g. Planning for the IFIM study will require scheduling of personnel and determination of study reaches. We will have to secure access from private landowners and complete coordination with Dr. Hal Beecher (WDFW) before final plans can be made for accomplishing this task in 1999 or 2000.

Task 2a. We will attempt to conduct steelhead and bull trout spawning surveys, depending on stream flows and the availability of access to private lands. Selected river segments (index areas) would be walked weekly if possible. Marked redds will be used to determine redd life (visibility duration). Bull trout surveys would supplement those currently conducted by the USFS, ODFW and WDFW.

Task 2b. Randomly selected snorkel or electrofishing sites will be surveyed for juvenile salmonid distribution and densities throughout the watershed within Washington. Snorkeling will usually involve two snorkelers conducting a total count of salmonids at each site. Salmonids captured during electrofishing will be identified and measured. Scale

and DNA samples (small fin clips) may be collected from a portion of the sampled fish. Block nets will be used to isolate the site during electrofishing and prevent ingress or egress of fish. Two or three pass electrofishing surveys and use of a depletion estimation formula will estimate the numbers of fish present at each site. Site length and width measurements will be used to calculate the area sampled. All juvenile sampling will occur between 5 July and 30 September to measure summer rearing conditions, distribution and densities.

Task 3a. WDFW will coordinate with ODFW for DNA sampling (small fin clip) of up to 100 wild steelhead and bull trout crossing the Nursery Bridge trap in Milton Freewater Oregon. Samples will be held in alcohol and sampling will follow the WDFW genetics DNA sampling protocol. Similar sampling will occur at a cooperatively operated trap in Yellow Hawk Creek and at the upper Touchet River. Each sample will receive a unique identification code.

Task 3b. Additional samples will be collected for juvenile salmonids during electrofishing surveys if we are unable to collect 50-100 samples from each adult collection site for each species. The same sampling protocol will apply as with the adults.

Task 3c. DNA analysis will be conducted at the WDFW Genetics Lab. in Olympia, WA with a DNA sequencer. Allele frequencies will be compared with other genetic samples and data sets in the Northwest to determine fish stock relationships.

Task 4a and b. Data will be compiled annually and disseminated orally and in written form. A final report will be completed that summarizes the entire project in 2001.

f. Facilities and equipment.

The WDFW Snake River Lab. has two portable Swoffer velocity meters for stream discharge measuring and two or more backpack electrofishers available for use on this project. Suitable vehicles are available for use part-time on this project. DNA processing equipment (DNA sequencer, etc.) are available at the WDFW Genetics Lab.

Purchases of equipment for the project will include a computer and accessories (~\$3,500) for data analysis and reporting, 5 water discharge monitoring stations (~\$1,300 each) and 12 water temperature monitoring units (~\$150 each). An electronic balance be purchased (~\$600-800), as will two dry suits for snorkeling (~\$500 each).

g. References.

Bureau of Reclamation. 1997. Watershed assessment - Upper Walla Walla River subbasin, Umatilla County, Oregon. Prepared for the Walla Walla Basin Watershed Council, Milton-Freewater, Oregon. 34p. plus appendices.

Busack, C. and J.B. Shaklee. 1995. Genetic Diversity Units and Major Ancestral Lineages of Salmonid Fishes in Washington. Washington Department of Fish and Wildlife Technical Rept. RAD 95-02.

Confederated Tribes of the Umatilla Indian Reservation (CTUIR). 1989. Walla Walla Subbasin Salmon and Steelhead Plan. Prepared for the Northwest Power Planning Council. Portland, Oregon.

Confederated Tribes of the Umatilla Indian Reservation (CTUIR). 1993. Walla Walla Master Plan (draft). Prepared for the Northwest Power Planning Council. Portland, Oregon.

Corps of Engineers (COE). 1992. Walla Walla River Basin Reconnaissance Report, Oregon and Washington. U. S. Army Corps of Engineers, Walla Walla District. Walla Walla, Washington.

Corps of Engineers (COE), 1997. Walla Walla River Watershed, Oregon and Washington Reconnaissance Report. U. S. Army Corps of Engineers, Walla Walla District. Walla Walla, Washington.

Covert, J. J., J. M. Lyerla, and M. D. Ader. 1994. Initial Watershed Assessment - Tucannon River Watershed: Washington State Department of Ecology Open File Technical Report 95-04, 44p.

Hankin, D.G. and G.H. Reeves. 1988. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. *Can. J. Fish. Aquatic Sci.* 45: 834-844.

Independent Scientific Review Panel (ISRP). 1997. Review of the Columbia River Basin Fish and Wildlife Program as directed by the 1996 amendment to the Power Act. ISRP Report 97-1 for the Northwest Power Planning Council. Portland, Oregon.

Mendel, G., et al. 1993. Tucannon River Spring Chinook Salmon Hatchery Evaluation Program Report - 1992 Annual Report. AFF 1/LSR-93-06. Washington Department of Fisheries report to the U.S. Fish and Wildlife Service, Lower Snake River Compensation Plan Office, Boise, Idaho.

Nielson, R.S. 1950. Survey of the Columbia River and its Tributaries, Part 5. U.S. Fish and Wildlife Service, Scientific Report: Fisheries, No. 38, 41 p.

Northwest Power Planning Council (NPPC). 1995. 1994 Columbia River Basin Fish and Wildlife Program (as amended in 1995). Portland, Oregon.

Northwest Power Planning Council (NPPC). 1997. Columbia River Basin Fish and Wildlife Program - Fiscal Year 1998. Annual Implementation Work Plan. Portland, Oregon.

Zimmerman, B. 1993. Northeast Oregon Hatchery Project (NEOH)- Walla Walla Investigative Report No. 1. Confederated Tribes of the Umatilla Indian Reservation report to Bonneville Power Administration. 6p.

Section 8. Relationships to other projects

The proposed project is closely related to projects 8805302, and 9604600 in the Walla Walla basin. It is also indirectly associated projects 9606400, 9601200, and 9601100. See section 7C for discussion or relationships.

Section 9. Key personnel - the Project leader will be Glen Mendel

GLEN W. MENDEL, Washington Department of Fish and Wildlife, Snake River Lab. - 401 S. Cottonwood St., Dayton, WA 99328 - (509) 382-1005, FAX (509) 382-2427.

Education: - Supplemental Aquatic biology courses (1983), University of Idaho
- M.S. degree -- Wildlife Resources (1979), University of Idaho.
- B.S. degree -- Wildlife/fisheries (1975),
- B.S. degree -- Biology (1973) Univ. of Idaho.

Employment History:

Fish Biologist 3 (fish management) for the Washington Department of Fish and Wildlife (WDFW) in SE WA (part-time since April 1997). Assistant project leader for evaluation of Lyons Ferry Hatchery program for spring and fall chinook salmon and steelhead (Mar. 1994-present).

Fishery Biologist 3 for the Washington Department of Fisheries (5/1991 to 3/1994). Field supervisor for three projects: Monitoring and evaluation of Lyon's Ferry spring and fall chinook salmon hatchery programs (as part of the Lower Snake River Compensation Plan - LSRCP), and conducting adult fall chinook salmon radio telemetry research to evaluate upstream migration and spawning in the Snake River. Planned, directed and supervised these projects with 3 permanent staff, and up to 10 seasonal support staff.

Habitat Biologist 3 for the Washington Department of Wildlife (12/1988 to 5/1991). Main duties included reviewing and responding to environmental permits to protect fish and wildlife and their habitats in 3 SW Washington counties.

Fish Biologist 2 (7/1984 to 12/1988).

Wildlife Biologist 2 for the Washington Department of Game (5/1983 to 7/1984). Biologist in charge of the Instream Habitat Improvement Study for several streams in SE WA.

Biologist - Fisheries (GS/7) for the US Army Corps of Engineers (Jan-Sep. 1982, Apr. - Jun. 1981).

Wildlife Biologist 2 for the Washington Department of Game (June - Dec. 1981, Jan. - Apr. 1981). Senior biologist on a study of anadromous fisheries enhancement potential in SE WA. Evaluated salmonid habitat and predicted salmonid biomass in streams by using the Wyoming HQI model. Estimated fish populations from electrofishing samples at 46 sites in 9 streams. Assisted with data collection for the Instream Flow Incremental Methodology.

Research Aid for the University of Idaho Cooperative Fisheries Research Unit (Sept. 1980 - Jan. 1981).

Wildlife Biologist (GS/7) for the USDA Soil Conservation Service (May - Dec. 1979).

Publications: several publications in journals and symposium proceedings, and many agency reports regarding salmonid populations and their habitats .

JOHN J. COVERT
811 w. 24TH Spokane, WA 99203
phone 509-456-6328

Current Position:

Hydrogeologist 3, Shorelands and Water Resources program, WA Department of Ecology. August 1990 - present.

Past Experience:

Computer information Consultant 2 for the WDOE Water Resources Program. May 1988-1990.

Senior Geologist, Conoco Inc. January 1983-May 1988.

Research Assistant, Department of Geology and Geophysics, Univ. of Utah. 1980-1982.

Academic Record:

M.S. Degree (1983) Univ. Of Utah, College of Mines.

B.S. Degree (1980) Univ. of Michigan, College of Engineering.

Teaching Fellowship (1981) Univ. of Utah, Geological Society of America Penrose Grant.

Publications:

Bowman, J.R., Covert, J.J., Clark, A.H., and Mathison, G.A. 1985. The CanTung E Zone Scheelite Skarn Orebody, Tungsten, N.W.T., Oxygen, Hydrogen and Carbon Isotope Studies: Econ. Geol. v. 80:1872-1985.

Olson, T.M., Covert, J.J.. 1994. Eastern Washington observation well network. Washington Department of Ecology open file technical report 94-04, 94p.

Covert, J.J., Lyerla, J.M. and Ader, M.D. 1994. Initial Watershed assessment Tucannon River watershed: Washington Department of Ecology open file technical report 95-04, 44p.

JAMES BROOKER SHAKLEE

BUSINESS ADDRESS

Washington Department of Fish & Wildlife
600 Capitol Way N.
Olympia, Washington 98501-1091
Phone: (360) 902-2752
e-mail: shakljbs@dfw.wa.gov FAX: 360-902-2944

HOME ADDRESS

4522 46th Ave. N.E.
Olympia, WA 98516
Phone: (360) 459-8030

PRESENT POSITION

Research Scientist (Washington Department of Fish and Wildlife)

EDUCATIONAL BACKGROUND

M.S. Fishery Biology (1974) Colorado State University
Ph.D. Biology (1972) Yale University
M.Phil. Biology (1970) Yale University
B.S. Zoology (1968) Colorado State University

PROFESSIONAL EXPERIENCE

1987-present Research Scientist; Washington Department of Fisheries
1985-1987 Fishery Biologist; Washington Department of Fisheries
1981-1985 Senior Research Scientist; CSIRO Division of Fisheries Research; Cleveland,
AUSTRALIA
1975-1981 Assistant Professor; Department of Zoology, University of Hawaii and Hawaii Institute
of Marine Biology
1974-1975 & 1972-1973 Postdoctoral Research Associate; University of Illinois

SELECTED PUBLICATIONS (since 1991)

- Shaklee, J.B.** and P. Bentzen. 1997. Genetic identification of stocks of marine fish and shellfish. [SUBMITTED].
- Shaklee, J.B.** and N.V. Varnavskaya. 1994. Electrophoretic characterization of odd-year pink salmon (*Oncorhynchus gorbuscha*) populations from the Pacific coast of Russia, and comparison with selected North American populations. *Can. J. Fish. Aquat. Sci.* 51(Suppl. 1):158-171.
- Shaklee, J.B.**, J. Salini, and R.N. Garrett. 1993. Electrophoretic characterization of multiple genetic stocks of barramundi perch in Queensland, Australia. *Trans. Amer. Fish. Soc.* 122:685-701.
- Shaklee, J.B.**, C.A. Busack, and C.W. Hopley. 1993. Conservation genetics programs for Pacific salmon at the Washington Department of Fisheries: Living with and learning from the past, looking to the future. pp.110-141. In: K.L. Main and E. Reynolds (eds.) *Selective Breeding of Fishes in Asia and the United States. Proceedings of a workshop in Honolulu, Hawaii May 3-7, 1993.* The Oceanic Institute, Honolulu, HI.
- Shaklee, J.B.** and S.R. Phelps. 1992. Chinook salmon NADP⁺-dependent cytosolic isocitrate dehydrogenase: Electrophoretic and genetic dissection of a complex isozyme system and geographic patterns of variation. *Biochem. Genet.* 30:455-489.
- Shaklee, J.B.**, D.C. Klaybor, S. Young, and B.A. White. 1991. Genetic stock structure of odd-year pink salmon, *Oncorhynchus gorbuscha*, Walbaum, from Washington and British Columbia and potential mixed-stock fisheries applications. *J. Fish Biol.* 39(Supplement A):21-34.
- White, B. and **J.B. Shaklee**. 1991. Need for replicated electrophoretic analyses in multiagency genetic stock identification programs (GSI): examples from a pink salmon (*Oncorhynchus gorbuscha*) GSI fisheries study. *Can. J. Fish. Aquat. Sci.* 48:1396-1407.
- Shaklee, J.B.** 1991. Simulation and other analysis of the 1991 Columbia River spring chinook GSI baseline. Technical Report 115 (40pp.), Washington Department of Fisheries, Olympia, WA.

Section 10. Information/technology transfer

Data will be summarized annually and distributed to BPA, CTUIR, ODFW and others for Walla Walla Watershed planning and restoration implementation. Annual progress will be presented orally at BPA progress review workshops and in other forums. The final report will be compiled by WDFW and printed and distributed by BPA in 2001.