
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Mainstem Columbia River Umbrella Proposal

BPA project number: 20515

Contract renewal date (mm/yyyy): Multiple actions?

Business name of agency, institution or organization requesting funding

Oregon Department of Fish and Wildlife

Business acronym (if appropriate) ODFW

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses

N/A

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

N/A

Other planning document references

Proposed Recovery Plan for Snake River Salmon (NMFS);
Wy-Kan-Ush-Me Wa-Kush-Wit;
Return to the River;
Multi-Year Implementation Plan;
Columbia River Fish Management Plan (US v. Oregon);
Oregon Trust Agreement Planning (OTAP) Project;
Assessing OTAP Project Using GAP Analysis

Short description

This proposal explains the management intent for anadromous and resident fish, and for wildlife in and along the mainstem Columbia and Snake rivers. Objectives for key species are described, as are strategies and actions to meet those objectives.

Target species

All species of anadromous and resident salmonids; white sturgeon and other resident species; native wildlife species, including habitat indicator species.

Section 2. Sorting and evaluation**Subbasin**

Mainstem 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 checked="" type="checkbox"/> Resident fish <input checked="" type="checkbox"/> Wildlife	<input checked="" type="checkbox"/> Multi-year (milestone-based evaluation) <input type="checkbox"/> Watershed project evaluation	<input type="checkbox"/> Watershed councils/model watersheds <input checked="" type="checkbox"/> Information dissemination <input checked="" type="checkbox"/> Operation & maintenance <input type="checkbox"/> New construction <input checked="" type="checkbox"/> Research & monitoring <input checked="" type="checkbox"/> Implementation & management <input checked="" type="checkbox"/> Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description
20515	Mainstem Columbia River Umbrella Proposal
9306000	Evaluate Columbia River Select Area Fisheries
8906900	Annual Coded Wire Tag Program - Missing Production Oregon Hatcheries
8201300	Coded Wire Tag Recovery Program
9105	Determine if Salmon Are Successfully Spawning Below Lower Columbia Dams
8712700	Smolt Monitoring by Non-Federal Agencies
9600800	PATH-Participation by State & Tribal Agencies
8810804	Streamnet: The Northwest Aquatic Information Network
8605000	White Sturgeon Mitigation & Restoration in the Columbia & Snake Rivers
9007700	Northern Pikeminnow Management Program
9007800	Evaluate Predator Control and Provide Technical Support for PATH
9079	Inventory Resident Fish in Bonneville, The Dalles, & John Day Reservoirs
9705900	Securing Wildlife Mitigation Sites in Oregon (Umbrella)
9705904	Securing Wildlife Mitigation Sites in Oregon - Horn Butte
9705911	Securing Wildlife Mitigation Sites in Oregon - Irrigon WMA Addition

9705909	Securing Wildlife Mitigation Sites in Oregon - Mitchell Point
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Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9702400	Avian Predation on Juvenile Salmonids in the Lower Columbia River	Complementary study of predation by birds downstream from area covered by 9007700.
9700900	Evaluate Means of Rebuilding White Sturgeon Populations in the Snake River	Complementary project to study and restore white sturgeon populations outside the geographical bounds of 8605000.
9093	Consumptive Sturgeon Fishery - Hells Canyon and Oxbow Reservoirs	Complementary project to study and restore white sturgeon populations outside the geographical bounds of 8605000.
9084	Assessing Genetic Variation Among Columbia Basin White Sturgeon Populations	Genetic analyses from project 9084 will be used to guide supplementation and propagation developed by project 8605000 (under this umbrella).
9603201	Begin Implementation of Year 1 of the K-Pool Master Plan Program	Propagation techniques developed as part of project 8605000 will be used by project 9603201.
8906500	Annual Fish Marking Program-Missing Production Groups OR/WA/ID	Recovery of CWTs from marked fish released by BPA-funded program.
8906600	Annual Coded Wire Tag Program-Missing Production WA HTCH	Recovery of CWTs from marked fish released by BPA-funded program.
9701400	Evaluation of Juvenile Fall Chinook Stranding on the Hanford Reach	Provides information relating to operation of the hydrosystem.
9602100	Gas Bubble Disease Research and Monitoring of Juvenile Salmonids	Provides information relating to operation of the hydrosystem.
9300802	Symptoms of GBT Induced in Salmon by TDGS of the Columbia and Snake Rivers	Provides information relating to operation of the hydrosystem.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
1992	Determined status of sturgeon populations downstream from McNary Dam; recommended development of	Yes. Recommendations were made for mitigation actions and further research.

	mitigation actions.	
1993	Identified potential wildlife mitigation opportunities by priority (OTAP Project).	Yes. Facilitates restoration of native wildlife populations.
1997	Created series of databases and GIS layers to assist in the evaluation of potential wildlife mitigation projects (GAP Analysis Project).	Yes. Facilitates restoration of native wildlife populations.
1997	Implemented actions to mitigate and restore white sturgeon populations.	Yes. Preliminary results indicate abundance of white sturgeon has increased in The Dalles and John Day reservoirs.
1997	Reduced predation on juvenile salmonids through sustained harvest of northern pikeminnow.	Yes. Predation on outmigrants reduced.
1998	Established StreamNet as a data management tool used by a number of fish management agencies.	Yes. Streamnet is used by many agencies.
1998	Through PATH, completed assessments of the likelihood of recovery for Snake River chinook salmon under various hydrosystem operations.	Yes. Facilitates making recommendations for operation of the hydrosystem to optimize chances for recovery.
1998	Maintained and continued to improve the CWT database.	Yes. Facilitates improved management of fisheries.
1998	Demonstrated the potential for establishing fisheries in select areas.	Yes. May allow establishment of fisheries with minimal impact on wild stocks.
1998	Documented mainstem spawning of chinook salmon.	Yes. Facilitates making recommendations for operations at Bonneville Dam to optimize spawning and rearing conditions.
1998	Maintained real-time data collection of juvenile salmonid outmigrations.	Yes. Facilitates making decisions regarding spill and flow to optimize migration conditions.
1998	Annual estimates of salmonid returns to the Columbia River, and estimates of recreational and commercial harvest.	Yes. Provides updates on status of anadromous stocks.
1998	Identified 3 potential sites in Columbia River mainstem area that would meet wildlife mitigation objectives.	Yes. Facilitates restoration of native wildlife populations.

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Increase returns of hatchery and	a	Protect and enhance habitat by

	naturally produced salmonids to the Columbia River basin		providing necessary flows through dam operations
		b	Decrease predation on juvenile salmonids
		c	Develop escapement goals necessary to protect listed or depressed stocks and ensure adequate hatchery escapement
		d	Apply CWT mark to all major salmonid stocks released from Oregon hatcheries in the Columbia River basin
		e	Develop fisheries in select areas of the Columbia River that target hatchery-produced salmonids while avoiding impact on listed stocks.
		f	Monitor fisheries harvesting listed or depressed stocks to ensure that harvest impacts do not exceed ESA limits
		g	Use life cycle model to quantify effects of various management strategies on recovery of listed or depressed stocks.
2	Maintain and enhance production of native resident fish, including white sturgeon, in the Columbia and Snake rivers	a	Protect and enhance habitat by providing necessary flows through dam operations
		b	Use supplementation, artificial propagation, and intensive fisheries management to increase abundance of populations depressed by poor reproduction
3	Maintain and enhance populations of wildlife native to the Columbia River basin	a	Acquire and ease riverine, riparian, wetland, and upland habitat suitable for native wildlife species
		b	Enhance habitat for native wildlife species through control of exotic plants, alteration of land use practices, and control of public access.

Objective schedules and costs

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

Schedule constraints

N/A

Completion date

N/A

Section 5. Budget

FY99 project budget (BPA obligated): \$0

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	N/A	%0	
Fringe benefits	N/A	%0	
Supplies, materials, non- expendable property	N/A	%0	
Operations & maintenance	N/A	%0	
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	N/A	%0	
NEPA costs	N/A	%0	
Construction-related support	N/A	%0	
PIT tags	# of tags: N/A	%0	
Travel	N/A	%0	
Indirect costs	N/A	%0	
Subcontractor	N/A	%0	
Other	N/A	%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"/>	Bonneville Power Administration. 1993. Oregon Trust Agreement Planning Project: Potential Mitigation to the Impacts on Oregon Wildlife Resources Associated with Relevant Mainstem Columbia River and Willamette River Hydroelectric Projects.
<input type="checkbox"/>	Columbia Basin Fish and Wildlife Authority. 1997. Multi-Year Implementation Plan.
<input type="checkbox"/>	Columbia River Inter-Tribal Fish Commission. 1995. Wy-Kan-Ush-Mi Wa-Kish-Wit; The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes.
<input type="checkbox"/>	Independent Scientific Group. 1996. Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem.
<input type="checkbox"/>	National Marine Fisheries Service. 1995. Proposed Recovery Plan for Snake River Salmon. U.S. Department of Commerce, National Oceanic and Atmospheric Administration.
<input type="checkbox"/>	Northwest Power Planning Council. 1984. 1994 Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council, Portland, OR.
<input type="checkbox"/>	Oregon Department of Fish and Wildlife. 1997. Assessing Oregon Trust Agreement Planning Project Using Gap Analysis. Report to Bonneville Power Administration.
<input type="checkbox"/>	

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PART II - NARRATIVE

Section 7. Abstract

This intent of this umbrella proposal is to explain the management intent for anadromous fish, resident fish, and wildlife in and along the mainstem Columbia and Snake rivers. The management intent is explained by describing the set of management objectives for key species, and by describing the set of strategies and actions taken to meet those objectives. The umbrella proposal lists individual projects that address the objectives and relates those projects to the objectives and each other through strategies. Objectives for the mainstem Columbia and Snake rivers are: (1) increase returns of hatchery and naturally produced salmonids to the Columbia River basin, (2) maintain and restore production of resident fish, including white sturgeon, in the Columbia and Snake rivers, and (3) maintain and restore populations of wildlife native to the Columbia River basin. Strategies to meet these objectives are (1a) protect and restore habitat for salmonids by providing necessary flows through dam operations, (1b) decrease predation on juvenile salmonids, (1c) develop escapement goals necessary to protect listed or depressed stocks and ensure adequate hatchery escapement, (1d) apply CWT mark to all major salmonid stocks released from Oregon hatcheries in the Columbia River basin, (1e) develop fisheries in select areas of the Columbia River that target hatchery-produced salmonids while avoiding impact on listed stocks, (1f) monitor fisheries harvesting listed or depressed stocks to ensure that harvest impacts do not exceed ESA limits, (1g).use life cycle model to quantify effects of various management strategies on recovery of listed or depressed stocks, (2a) protect and restore habitat for resident fish, including white sturgeon, by providing necessary flows through dam operations, (2b) use supplementation and artificial propagation to increase abundance of populations depressed by poor reproduction, (3a) acquire and ease riverine, riparian, wetland, and upland habitat suitable for native wildlife species, and (3b) restore habitat for native wildlife species through control of exotic plants, alteration of land use practices, and control of public access.

Section 8. Project description

a. Technical and/or scientific background

The Columbia River flows approximately 1,270 miles from its headwaters in British Columbia to the Pacific Ocean. The Columbia’s largest tributary, the Snake River, is about 1,000 miles in length. The system drains 219,000 square miles in the western U.S. and 39,500 square miles in British Columbia. In terms of water volume, the Columbia River is the second largest in the U.S. with an annual runoff at its mouth of about 198 million acre-feet (275,000 cfs). The river historically supported populations of

anadromous salmonids including the 5 species of eastern Pacific salmon (chinook, coho, chum, sockeye, and pink), as well as steelhead. Other salmonids utilizing the river included cutthroat trout and bull trout. Other fish species important to commercial, tribal, and recreational fishers included white sturgeon, green sturgeon, smelt, and lamprey.

The Columbia River basin historically included habitat suitable for a diverse array of wildlife. The types of wildlife habitats vary along the Columbia and Snake River mainstems. A variety of wildlife species, including large and small mammals, waterfowl, passerines, raptors, reptiles, and amphibians, are associated with riverine and adjacent riparian forest, wetland, island, mixed coniferous and deciduous forest, and shrub-steppe habitats.

Fish and wildlife resources utilizing the mainstem Columbia and Snake rivers constitute a fraction of historical numbers. Estimates of adult Pacific salmon historically returning to the Columbia River basin range from 7.5 to 16 million, but returns from 1990-94 averaged only 1.2 million fish. Currently, less than 25% of returning fish are wild in origin. Most spawning by summer chinook salmon historically occurred in the upper Columbia River and most spawning by fall chinook salmon occurred in the lower river. Mainstem spawning is currently limited to about 40,000 chinook salmon in the Hanford reach of the Columbia River, about 5,000 chinook salmon downstream from Bonneville Dam, and about 25,000 steelhead in the mainstem Snake River.

White sturgeon were also historically abundant throughout the Columbia and Snake rivers. Although white sturgeon downstream from Bonneville Dam are abundant enough to still support important recreational and commercial fisheries; populations upstream from Bonneville Dam have declined drastically and support limited or no harvest.

A key factor limiting fish and wildlife resources in the mainstem Columbia and Snake rivers has been development of the hydrosystem. The rapid decline of Pacific salmon after mass immigration of Europeans to the Columbia river basin has been associated with the cumulative effects of habitat loss and degradation, hatchery practices, overexploitation, and impediments to upstream and downstream movement from dams. Dams and impoundments altered flow and temperature patterns, reduced available spawning habitat, and increased mortality of juvenile salmonids due to passage through turbines and predation. Habitat improvement programs and severe restrictions on commercial fishing allowed runs to rebound during the 1950's and early 1960's; however, continued habitat degradation and hydrosystem development during the 1970's in the upper Columbia and lower Snake rivers caused major declines in upriver stocks.

Development of the hydrosystem has resulted in a white sturgeon population or collection of populations that are less productive than the population historically present. White sturgeon that once moved freely within the Columbia and Snake rivers and between the rivers and ocean are now at least partially blocked by dams. Habitat has been altered by flow regulation, channel modification, diking, and dredging. Reproduction and recruitment have been particularly vulnerable to changes caused by dams.

Development of the hydrosystem has also affected many species of wildlife. Habitat lost to the construction of hydroelectric facilities was home to many, interdependent species. Floodplain and riparian habitats important to wildlife were inundated when reservoirs were filled. Activities associated with hydroelectric development and operation, such as fluctuating water levels, have altered land and stream areas that affect wildlife. In some cases, dam operations have created barren vegetation zones, which expose wildlife to increased predation. Other activities related to hydroelectric development (e.g., road construction, the draining and filling of wetlands) have altered land and streams areas in ways that affect wildlife. In some cases, the construction and maintenance of power transmission corridors altered vegetation, increased access to and harassment of wildlife, and increased erosion and sedimentation in the Columbia River and its tributaries. Other

impacts to wildlife and wildlife habitats along in the mainstem river area caused by hydropower construction and operation include irrigation, agricultural practices, livestock management practices, human development, forest management practices, noxious weeds, and the loss of prey base for certain wildlife species. Any of these influences can, and are, limiting factors to local wildlife populations. Changes in local populations can affect species integrity on a larger scale.

b. Rationale and significance to Regional Programs

Projects under this mainstem umbrella will contribute to the Northwest Power Planning Council's FWP goals of doubling fish runs while maintaining biological diversity, and providing a healthy Columbia River basin that supports human settlement and long-term sustainability of native fish. Reduced predation will lead to increased survival of both wild and hatchery juvenile salmonids from numerous subbasins, which may then contribute to increased returns of adults. Therefore, reduction in predation by northern pikeminnow is specifically called for under Measures 5.7A and 5.7B of the FWP. Evaluating Columbia River select area fisheries specifically addresses measure 8.3C, which calls for the identification and development of terminal fishing opportunities to harvest abundant stocks while minimizing the incidental harvest of weak stocks. Determining if salmon are spawning below dams directly addresses measure 7.1C, which calls for the collection of population status and life history data on wild and naturally spawning populations. StreamNet, the Northwest Aquatic Information Network, directly addresses measures 3.3A, 3.3B, 3.3C and 3.3D.

The PATH project and the two Coded Wire Tag Programs (Missing Production and Recovery) are examples of projects that are not specifically addressed in the FWP but produce data that is essential to achieving measures set forth in the FWP. Data and analyses produced by these projects support a large number of measures set forth in Chapter 7, *Coordinated Salmon Production and Habitat*, and Chapter 8, *Salmon Harvest*. Examples of the measures these projects address include:

- 4.3C Population Monitoring;
- 7.1A Evaluation of Carrying Capacity;
- 7.1F Systemwide and Cumulative Impacts of Existing and Proposed Artificial Production Projects;
- 7.2B Hatchery Evaluation;
- 7.2D Improved Propagation at Existing Facilities;
- 7.5B Snake River Fall Chinook Salmon;
- 8.1 Harvest Goals and Escapement Objectives;
- 8.2 Exploitation Rates and Regimes;
- 8.4C Marking Hatchery Salmon;
- 8.4D Improve Stock Abundance Prediction Methods;
- 8.5F U.S. and Canada Pacific Salmon Treaty.

Actions to protect and restore populations and mitigate for effects of the hydropower system will increase productivity of white sturgeon in the basin. Therefore, measure 10.4A of the FWP program calls for the study and evaluation of sturgeon populations: "The Council believes that studies and evaluations should be undertaken and completed quickly, and on-the-ground projects identified and completed as soon as possible to address the needs of this species. In addition, these studies should be coordinated to avoid redundant work and to increase the potential for learning." Measure 10.4A.2 further states that "Specific recommendations for the protection, mitigation, and enhancement of sturgeon may be submitted to the Council upon completion of these studies."

Actions to enhance habitat on acquired and eased lands will contribute to the FWP goal of achieving and sustaining levels of habitat and species productivity as a means to fully mitigate for wildlife losses caused by the construction and operation of the hydropower system. The protection of high quality native habitats or species of concern is called for under Measure 11.2D.1. Projects proposed under this umbrella proposal are consistent with and will help fulfill the FWP's mitigation goals for priority habitats and indicator species.

c. Relationships to other projects

Increasing the returns of anadromous salmonids to the Columbia and Snake rivers relies on activities within all associated subbasins; therefore, projects in subbasins are naturally related to projects in the mainstem. The anadromous salmonid projects under this umbrella proposal are an integral part of efforts to increase returns because fish that spawn and rear in subbasins must also migrate through the mainstem.

Natural cycles of ocean and estuary conditions affect productivity, and therefore returns of anadromous species. Offshore and international fisheries also affect populations either directly or through harvest of prey species.

Resources in the Columbia River basin are also affected by water management in Canada. Spill from dams in Canada affects our ability to manage levels of dissolved gas. Dam operations also affect our ability to provide optimum flows and water levels for anadromous fish, resident fish, and wildlife.

The three specific wildlife mitigation project proposals under this umbrella collectively relate to one another, and to other individual wildlife project proposals identified by the Oregon Wildlife Coalition umbrella which fall outside the mainstem area addressed in this proposal, in that their aim is to achieve full mitigation for documented wildlife habitat losses in Oregon. Also, these three projects and the Oregon Wildlife Coalition umbrella area a direct product of coordination and planning activities conducted by the Coalition over the last few years.

d. Project history (for ongoing projects)

Fish

The Columbia River once supported large numbers of Pacific Salmon. The rapid decline of this resource began with the mass immigration of Europeans beginning in the mid-1800's. This decline has been associated with the cumulative effects of habitat loss and degradation, hatchery practices, overexploitation, and hydrosystem development. Habitat improvement programs and severe restrictions on commercial fishing allowed runs to rebound to levels that permitted moderate harvest during the 1950's and early 1960's; however, continued habitat degradation and hydrosystem development during the 1970's caused major declines in upriver stocks. By 1975, 15 dams impounded the Columbia and Snake rivers in Oregon and Washington. Restoration of salmon runs in the Columbia Basin has been the goal of a wide variety of state and federal programs.

The Mitchell Act was passed in 1938 and amended in 1946. It was intended to "provide for the conservation of the fishery resources of the Columbia River". The program included habitat restoration, fish screening, and passage projects. The main focus of the Mitchell Act in the 1950's and 1960's turned towards using hatcheries to supply the ocean and lower Columbia River commercial and sport fisheries. In recent

year, funding for the hatchery program has been reduced, jeopardizing the continuing operation of the hatcheries.

The Lower Snake River Fish and Wildlife Compensation Plan (LSRCP) was authorized by the Water Resources Development Act of 1976. The LSRCP was designed to mitigate for losses of fish and wildlife caused by the four federal dams on the lower Snake River. Authorized fish production included 23 hatcheries constructed by the U.S. Army Corps of Engineers.

Columbia River salmon were first considered for listing as threatened or endangered species under the Endangered Species Act (ESA) in 1979. Upper Columbia River chinook salmon had declined to record low numbers, and existing management and operations were considered inadequate to protect and restore them. Listing under the ESA was avoided after Congress passed the Northwest Power Act in 1980, which included the fish and wildlife program (FWP) and provisions to protect and restore Columbia Basin anadromous fish, resident fish, and wildlife. This gave the region an opportunity to design and implement a program for protection of all anadromous and resident fish and wildlife in the Columbia Basin.

Continued declining numbers in the 1980's led to the listing of Snake River salmon as threatened and endangered species. The NMFS released the *Proposed Recovery Plan for Snake River Salmon* in 1995. Currently, several salmonid stocks are listed and many more are proposed for listing. Harvest restrictions and escapement goals set forth by the 1988 (U.S. v Oregon) *Columbia River Fish Management Plan* work in conjunction with measures set forth in the ESA to restrict harvest, alter hydropower operations, change hatchery practices, and improve habitat to rebuild depressed runs and maintain healthy runs.

In addition, the region has other legal obligations that must be met regarding fish and wildlife, and that are complemented by the FWP. These include tribal treaty fishing rights, Executive Order tribal rights, salmon rebuilding obligations of the 1985 *U.S.–Canada Pacific Salmon Treaty*, and requirements of the federal Clean Water Act. These necessitate measures beyond those to remove listed salmon stocks from the Endangered Species list.

White sturgeon have also been the target of restoration efforts. Historically, white sturgeon were abundant in the Columbia River, and supported an intense commercial fishery in the late 1800's. By the late 1890's, overfishing had resulted in population declines such that catch decreased from more than 2.4 million kg in 1892 to about 33,000 kg in 1899. Following the decline in catch, the states of Oregon and Washington adopted management regulations to protect white sturgeon. Size and limit regulations in commercial and sport fisheries continued to become more restrictive through the 1980's. The white sturgeon population downstream from Bonneville Dam eventually recovered from overfishing, and is now one of the largest populations in the world. Conversely, productivity in reservoirs is 10-100 times less than productivity downstream from Bonneville Dam. An agreement between the states of Oregon and Washington called the "Olympia Accord" sets forth harvest restrictions necessary to ensure the future health of sturgeon populations.

Wildlife

During the early and mid 1980's, BPA began funding wildlife loss assessments for construction of and inundation by the major hydroelectric dams. The first studies completed were those for Libby and Hungry Horse Dams. BPA undertook negotiations to have Montana undertake the mitigation. The Council and the region's utilities encouraged Bonneville to establish a trust fund, giving Montana flexibility to acquire and maintain habitat as the opportunity arose. Bonneville eventually agreed, pending: 1) a

once-for-all-time settlement of Bonneville's wildlife obligation and; 2) a hold harmless clause which would make the state liable for any additional mitigation that might be required by the Council or anyone else during the next 60 years. The Council agreed that trusts are a good funding vehicle, but that once-for-all-time settlements were not in tune with either the Northwest Power Act or with FERC practice regarding mitigation at private hydroelectric facilities.

Regardless, in 1988, Montana reached an agreement with BPA, including a once-for-all-time settlement, and hold harmless conditions. Although the mitigation to be achieved under the agreement was based on the Council's FWP, and the Program called for BPA funding of a Montana trust "upon approval by the Council", the Council was not asked to approve this agreement and did not do so. The Council noted that the Montana Trust should not be considered a precedent for future wildlife mitigation.

In November 1989, the Council took up wildlife mitigation for most of the remaining federal hydroelectric projects in the Columbia River basin. The Council amended the FWP to include a wildlife mitigation goal of achieving 35% of the agency-submitted losses during the next decade, using the agency estimates as a "starting point". This Wildlife Rule established a two-track process for implementation of wildlife projects. One track called for projects to be submitted to BPA under the Implementation Planning Process. Once projects were reviewed and selected for inclusion in the BPA Annual Implementation Workplan, the Council's Wildlife Advisory Committee was to review them. The other track permits agreements if agreed to by all parties for a particular facility.

In 1990, the Nez Perce approached BPA about the possibility of an agreement for the Nez Perce portion of wildlife mitigation for Dworshak Dam. Following initial contacts with BPA, the tribe informed the Council and Idaho of its decision to seek a settlement. The state and the tribe began working on a joint agreement and memorandum of understanding for the entire Dworshak project. Once again, BPA insisted that the agreement be conditioned upon a once-for-all-time settlement and hold harmless agreement from the other parties. However, the Council advised BPA that an amendment to the Program was needed, and that the Council would be required to give full consideration to comments received in the amendment proceedings before making a final decision on the amendment.

In June 1991, the Council approved BPA implementation of the Conforth Ranch wildlife mitigation project. Because of concerns over the project by the Port of Umatilla, the Council instructed BPA to work with the Port to address the Port's concerns while proceeding with acquisition of the property. After several months of negotiating with the Port, (no agreement was reached) BPA announced its intent to acquire the Conforth property in early December 1991. Following the BPA announcement, Senator Packwood and Representative Bob Smith of Oregon, wrote the Secretary of Energy requesting that he overturn the BPA decision to acquire the ranch because of local opposition to the project. After meeting with the parties, the Bonneville Administrator announced that his decision to acquire the Conforth property was being put on hold for 45 days to continue discussions with the parties and to consider other alternatives.

On February 12, 1992 the BPA Administrator announced his decision on the Conforth project in a letter to Chairman Hallock. BPA's decision was to purchase a one-year option on the Conforth Ranch from the Trust for Public Lands. The letter also stated that it was BPA's decision to meet its responsibilities for wildlife mitigation "through long-term trust agreements with States, tribes, and other agencies." Though it was not clear in the letter what the extent of the policy was, BPA has since clarified that its intent is to do no more wildlife mitigation absent trust agreements. Discussions with BPA staff

indicate that this policy will apply to previously Council approved projects as well as to new projects.

In 1993, Washington and BPA signed an interim five-year agreement. The agreement guarantees \$45 million to Washington's wildlife managers over a five-year period. This was not a trust agreement, only a stream of funds. The Washington Coalition and BPA agreed to continue to negotiate for a long-term agreement. During this time the Council issued a draft rule which endorsed agreements as a preferred method to achieve wildlife mitigation and calls on BPA to enter into short-term agreements, similar to the Washington Agreement, with Oregon and Idaho and to negotiate long-term agreements over the next three years. BPA stated in comments on draft rule that it would not enter into short-term agreements. Bonneville then announced that its FY 1994 and FY 1995 budgets contained no funds for new wildlife projects, including implementation of activities called for in Phase 4 of the Draft Wildlife Rule.

The Council adopted the final Wildlife Rule in November 1993. The rule continued to call for short-term agreements (Section 11.3D) and states that if BPA cannot enter into such agreements in 90 days that the Council will then solicit projects from the agencies and tribes and approve them for implementation. If short-term agreements are not in place thereafter the Council will call for project proposals each October thereafter; long-term agreements are to be in place within three years. Because BPA failed to enter into short-term agreements with states and tribes, the Council solicited project proposals in late February 1994. In 1994 and 1995, Bonneville funded only a few new, individual wildlife mitigation projects outside the above agreements because the existing agreements used most or all of the available funds and there was a lack of any stable commitment from BPA to fund wildlife mitigation.

In August 1995, the Council completed a Wildlife and Resident Fish rule-making that included an amendment to establish specific funding percentages for Bonneville's Direct Program budget under a Memorandum of Agreement: 70% for anadromous fish and 15% each for Resident Fish and Wildlife. This MOA makes \$15M (plus interest) available each year from FY96 through FY01 to the region's wildlife managers for wildlife mitigation. While most of the available funds through FY98 will be used to finish up the Washington Interim Agreement, some funds have been available for use on other individual projects, notably the Chief Joseph and Southern Idaho projects. Unfortunately, in the history of BPA wildlife mitigation under the Council's program, few of Oregon's losses have been mitigated.

Oregon's wildlife managers (The Oregon Coalition or Coalition) have been working together since 1991 to coordinate the planning, selection, and implementation of BPA funded wildlife projects under the Council's FWP as outlined in Section 11, specifically measures 11.3D and 11.3E. The Oregon Wildlife Coalition (OWC) is made up of wildlife managers from ODFW, the Confederated Tribes of the Warm Springs Reservation in Oregon (CTWSRO), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Burns-Paiute Tribe (BPT), and the U.S. Fish and Wildlife Service (USFWS). In the early 1990's, the Coalition began developing a Memorandum of Agreement (MOA) to coordinate the planning, selection and implementation of BPA funded wildlife projects in Oregon under the Council's FWP.

BPA had determined that beginning in 1992 so-called "wildlife agreements" would be pursued with the wildlife management agencies of each state. These agreements were intended to take the place of the annual project submittal and approval process which, by 1993, had resulted in only three wildlife projects implemented region-wide. The agreements between the BPA and each state would include signatories from each tribe and agency responsible for implementing mitigation measures within the respective states. In order to develop an effective agreement, BPA stated it was necessary to

determine what the mitigation objectives of the agreement would be, the economic costs of achieving those objectives and the possible outcomes. Oregon's wildlife managers and tribes chose to develop the implementation team known as the Oregon Wildlife Coalition and proposed the Oregon Trust Agreement Planning (OTAP) Project as the means of achieving those objectives. In July 1992, the OTAP was initiated in response to BPA's desire to use trust funds/wildlife agreements as a mechanism to fund wildlife mitigation and to address concerns for having an "outcomes" based approach. It was Coalition's hope to develop an Oregon trust/wildlife agreement similar to what was done in Montana and Washington. The OTAP consisted of two parts. The first was the compilation of a database that contained information about potential mitigation sites. This information originated from Coalition project sponsors, various tribal and state management and mitigation plans, and the Oregon Natural Heritage Database. The second component of the OTAP consisted of gathering land values from recent land sales and appraisals within the geographic areas and habitat types where mitigation activities were likely to occur. A range of potential trust agreement costs was also calculated. This range was based upon the assumption of complete mitigation for the wildlife losses in Oregon.

In October of 1993, after a year of development, the findings of the OTAP were published (BPA 1993). Then in January of 1994, the Coalition began meeting to formulate a strategy for trust negotiations with BPA. In February 1994, the Coalition requested in writing that BPA begin trust fund negotiations. This met the Council's deadline for trying to get to interim agreements within 90 days after the rule went into effect. In March 1994, BPA responded positively and identified its' lead negotiators. Between April and July, BPA trust fund negotiations broke down when it became apparent that no BPA wildlife mitigation funds would be available and that BPA was moving away from trusts. In response to BPA's move away from trust funds, the Coalition stopped meeting for over a year and decided against a formal MOA in favor of some less formal structure.

During these years the Council's wildlife advisory group had become the Wildlife Working Group (now the Columbia Basin Fish and Wildlife Authority's [CBFWA's] Wildlife Caucus), made up of all the wildlife managers in the Columbia Basin. They met regularly to help implement the Council's wildlife rule and in doing so developed, reviewed and adopted habitat assessment tools and strategies. Once it became apparent from the Council's 1995 rule-making and the MOA negotiations that wildlife funding would become stable at approximately \$15M per year through 2001, the Wildlife Caucus started discussions of both long- and short-term funding for future wildlife mitigation in the Basin. Various strategies were discussed, but all agreed that Oregon had not received a reasonable share of funds spent to date. In the end, a budget was developed and adopted by the Wildlife Caucus covering BPA funds through FY 2001. This budget called for Oregon's wildlife mitigation to receive \$275K in FY97, \$500K in FY98, \$4M in FY99, \$5M in FY00, and \$6M in FY01. The first two years were earmarked for planning and coordination efforts, and the next three years for project implementation.

In helping develop this budget as members of the Wildlife Caucus, Oregon's coalition members realized the need to come together once again to start developing strategies on how best to implement wildlife mitigation in Oregon. The Coalition also realized the need for a formal MOA to document its' commitment to a coordinated, statewide approach to the planning and implementation of BPA funded wildlife mitigation projects in Oregon. At this time, a project to reaffirm the original findings of the OTAP Project was completed. This project, Assessing Oregon Trust Agreement Planning Process Using GAP Analysis, provided a more rigorous scientific/policy filter on the sites originally identified in the OTAP report and demonstrated the validity and applicability of that effort. The GAP Analysis project identified potential wildlife mitigation sites in

Oregon for possible acquisition. The draft results of the GAP effort, published in 1997 (ODFW 1997) characterize the potential contribution to the mitigation target species and habitats. In addition, the role a project might play in conservation planning, within the range of habitat types and conditions statewide, was determined. The results of this project, undertaken by ODFW, in coordination with BPA and other Oregon wildlife managers, will be used in the next phase of the OTAP Project to identify and prioritize wildlife mitigation opportunities.

The Oregon Wildlife Coalition has met regularly since this time. They developed a coordination and planning budget proposal for FY97 BPA funds, which due to contracting problems was not initiated until fall of 1997. This delay allowed the entities involved to provide staff dedicated to this planning and implementation effort. For the FY98 project proposal process, the Coalition developed and proposed the initiation of a small group of projects scattered throughout the state along with some continued funding of planning and coordination (Securing Wildlife Mitigation Sites in Oregon “Umbrella Proposal”). For FY99, specific project areas under the Coalition’s “Umbrella” (Project 0705900), including the Horn Butte (Project 9705904), Irrigon (Project 9705911), and Mitchell Point (Project 9705909) sites, were identified for purchase, enhancement or O&M along with a small coordination budget. In September 1998, the Council recommended to BPA that \$4M be available to the Oregon Wildlife Coalition to implement this suite of projects.

Currently, the Coalition is finalizing an updated MOA that outlines the shared vision for wildlife mitigation, mitigation planning and implementation operating principles and guidelines, and commitment to planning and implementing wildlife mitigation projects in a coordinated fashion throughout Oregon. The Coalition continues to work together to develop project priorities and implementation funding strategies.

e. Proposal objectives

- (1) Increase returns of hatchery and naturally produced salmonids to the Columbia River basin
- (2) Maintain and restore production of native resident fish, including white sturgeon, in the Columbia and Snake rivers
- (3) Maintain and restore populations of wildlife native to the Columbia River basin

The goal of this umbrella proposal for fish species is to restore sustainable, naturally producing populations when possible, or to mitigate for losses of naturally producing populations when necessary, to support tribal and non-tribal harvest and cultural economic practices, and non-consumptive practices, while protecting the biological integrity and the genetic diversity of the mainstem Columbia and Snake rivers. The wildlife mitigation goal along the mainstem Columbia and Snake rivers is to achieve and sustain levels of habitat and species productivity to fully mitigate for all wildlife and wildlife habitat losses caused by development and operation of the hydrosystem.

The objectives are designed to meet these goals. Strategies designed to meet the objectives are the individual projects under this umbrella. For example, maintaining and restoring production of white sturgeon in the Columbia and Snake rivers will be achieved through a combination of providing necessary flows through dam operations, and using supplementation and artificial propagation to increase abundance of populations depressed by poor reproduction (Project 8605000).

f. Methods

Objective 1 (*Increase returns of hatchery and naturally produced salmonids to the Columbia River basin*)

Strategies to increase returns are many, and the rationale of these strategies is compelling:

Decreases in predation on juvenile salmonids, which has been exacerbated by development of the hydrosystem, will increase smolt to adult survival;

Monitoring of fisheries harvesting depressed and listed stocks will ensure that harvest impacts do not exceed limits set forth in the ESA, and therefore aid in the recovery of depressed and listed stocks, and help maintain healthy stocks;

Developing escapement goals and monitoring escapement areas (natural and hatchery) will ensure that escapement is adequate to protect and rebuild depressed or listed stocks and maintain current production levels of hatchery stocks;

Increasing returns of hatchery reared salmon and steelhead to mitigate for losses in natural production resulting from the development of the hydropower system in the Columbia River basin will support important consumptive and non-consumptive fisheries for both treaty Indian and non-Indian fishing communities;

Increasing returns of hatchery reared stocks to areas that are devoid of naturally reproducing stocks allows development of fisheries that harvest naturally reared fish without impacting naturally produced fish;

Development of survival rate indices will be necessary to evaluate the effect migration mitigation measures and actions on the recovery of Columbia River listed stocks to determine if measures and actions are benefiting listed stocks;

Life cycle models will quantify effects of various management strategies on recovery of listed or depressed stocks for the purpose of determining which management strategies will be most effective in recovering listed or depressed stocks;

Providing the region with the best available scientific data will reduce risks of making incorrect management decisions due to erroneous data;

Providing stock status data to wide variety of users will aid in monitoring status of Columbia River salmon and steelhead stocks by standardizing data sets used by management agencies.

Specific actions included in these strategies include:

Projects 9007700 and 9007800: To effectively manage predation on juvenile salmonids, harvest northern pikeminnow, and monitor effects of harvest on predation.

Project 9306000: Release hatchery smolts into areas without significant naturally reproducing populations.

Project 8906900: Apply CWT mark to releases of salmon from majority of hatcheries in the Columbia River basin.

Projects 8201300 and 9105: Monitor and sample escapement areas, fisheries, and other mortality sources (i.e. prespawning mortalities) for the purposes of recovering biological data and CWT's.

Project 8201300: Determine stock compositions of salmon and steelhead returning to escapement areas, passing dams, and harvested in fisheries and succumbing to other sources of mortality (i.e. prespawning mortalities).

Project 8201300: Reconstruct runs to produce adult abundance estimates for all major stocks of salmon and steelhead returning to the Columbia River.

Project 8902401: Estimate survival rates of hatchery fish returning to various hatcheries and being subjected to a variety of rearing techniques and release strategies.

Project 8902401: Estimate smolt to adult survival rates for Columbia River salmon and steelhead stocks undergoing different in-river transportation strategies.

Project 9600800: Develop flow charts of key questions to consider when evaluating various management strategies.

Project 9600800: Compile and error-check data to insure that the best available scientific data is used when evaluating impacts of various management strategies.

Project 9600800: State hypotheses about mortality over the life cycle, evaluate strengths and weaknesses of supporting evidence, and test those hypotheses which have significant management implications.

Project 9600800: Develop life cycle model necessary for evaluating the effects of management alternatives on the status of Columbia River salmon and steelhead.

Project 9600800: Perform prospective analysis (weight of evidence and Bayesian modeling) to attempt to evaluate the ability of management actions to restore depressed populations.

Project 9600800: Integrate future information from basin wide research, monitoring, and adaptive management experiments in a quantitative framework for use by managers in determining effective fishery management strategies.

Project 8810804: Make data concerning status of Columbia River salmon and steelhead stocks readily available to a wide variety of users via the Internet.

Objective 2 *(Maintain and restore production of native resident fish, including white sturgeon, in the Columbia and Snake rivers)*

Strategies include using supplementation and artificial production to enhance harvest opportunities, and providing necessary flows through dam operations to protect and restore habitat. Supplementation and artificial production will increase abundance in reservoirs where survival and growth are adequate, but reproduction is limited. Providing optimal flows through dam operations will provide habitat necessary for restoring natural production.

Project 8605000: To enhance harvest opportunities, transplant juvenile white sturgeon from areas downstream from Bonneville Dam to nearby impoundments where hydrosystem operations have reduced white sturgeon productivity, and develop artificial propagation techniques and protocols for experimental propagation research.

Project 8605000: Regulate harvest of white sturgeon consistent with mitigation efforts to optimize harvest in white sturgeon fisheries.

Project 8605000: Determine the relationship between dam operations and spawning and rearing of white sturgeon to optimize physical habitat conditions for white sturgeon.

Project 9079: Inventory resident fish populations in Bonneville, The Dalles, and John Day reservoirs.

Objective 3 *(Maintain and restore populations of wildlife native to the Columbia River basin)*

Strategies to meet this objective include acquisition and easement of riverine, riparian, wetland, and shrub/steppe habitats, control of noxious weeds, alteration of grazing practices, and control of public access. Specific actions include:

Project 9705900: Coordinate and implement securing of wildlife mitigation sites in Oregon through development of wildlife mitigation strategies, land acquisition, and enhancement planning, and monitoring and evaluation of plan development..

Project 9705904: Acquire and ease shrub/steppe habitat in the Horn Butte area. Improve habitat conditions for wildlife through alteration of land use practices and control of noxious weeds.

Project 9705911: Acquire wetland habitat to expand ODFW's Irrigon Wildlife Management Area. Improve habitat conditions for wildlife through alteration of land use practices and control of noxious weeds.

Project 9705909: Acquire riverine/riparian habitat through landowner donation in the Ruthon Point area. Protect and maintain wildlife habitat values.

g. Facilities and equipment

N/A

h. Budget

N/A

Section 9. Key personnel

N/A

Section 10. Information/technology transfer

Annual reports summarizing the activities and results of individual projects are published by BPA. Special reports summarizing results are periodically published by BPA.

Many results are also published in scientific journals. For example, 11 papers directly resulting from project 9007700 (Northern Pikeminnow Management Program) have been published or accepted for publication in peer-review journals. Numerous manuscripts based on findings from project 8605000 (White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers Upstream from Bonneville Dam).have also been published in peer-review journals.

Project personnel also participate in symposia and workshops. The 1997 annual meeting of the American Fisheries Society included a session dedicated to predation studies in the Columbia River basin. The session was organized by project personnel. Findings from the project were also presented at the 1998 workshop "Management Implications of Co-occurring Native and Introduced Fishes", organized by ODFW and NMFS. A workshop organized by project 8605000 in December 1997 was attended by sturgeon biologists from throughout the Pacific Northwest.

Information collected is shared with fish and wildlife managers and is used to help develop or revise the management of fish and wildlife. For example, information on population status of white sturgeon gathered as part of project 8605000 is used to set maximum harvest limits in impoundments. In addition, new habitat restoration techniques will be shared with interested parties.

Congratulations!