



Project Report December 8, 2006

Strategic Plan

Objectives:

Recover fish and other aquatic resource populations protected under the Endangered Species Act.

105 projects found

13210-A-015 - [Fish Feed Development for the Captive Propagation of Threatened and Endangered Species](#)

Facility	Abernathy Fish Technology Center	Accomplishment Summary Preliminary feeding trials with coho and steelhead were conducted evaluating the use of different lipid (fat) sources on fish feed used in captive propagation of threatened and endangered species. Data analysis and report writing are underway. One peer-reviewed paper was published examining the performance of bonytail chub fed different diets.
Expended	\$23148	
Objective	Develop and share applied aquatic scientific and technologic tools with partners.	
Primary Benefited Species	Coho salmon or silver salmon (Oncorhynchus kisutch)	
Primary Benefited Population	Not specified	
Plans	Hood Canal Salmon Management Plan (Quilcene NFH) Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)	
Keyword	Fish Technology	
Need Number	N-002	
Partners		
Accomplishments		
		The importance to the Resource:
		Good nutrition is essential for wild fish when they are placed in NFHs, used as refuges, to protect and increase their numbers. Habitat destruction has brought about the realization that there will be a greater dependence on maintaining stocks to replenish the numbers in the wild.
		The problem:
		As more declining, threatened, and endangered species are moved into captive environments, it will be crucial to have feeds developed to meet their needs.
		The objective:
		Diets will be developed that are specific for the

Number of Fishery Management Plan production tasks implemented (PART)	2	<p>each species and will enhance the survival and maintain the health of the fish.</p> <p>The method:</p> <p>As diets are developed they will be fed to the fish using standard nutrition study protocols in controlled tank studies to determine which formulations perform optimally.</p> <p>Further description:</p> <p>Nutrition</p>
Number of techniques and culture technology tools developed.	1	
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1	

13210-A-019 - [Development of a Native Broodstock for Use in Restoration and Recovery](#)

Facility	Abernathy Fish Technology Center	<p>Accomplishment Summary</p> <p>We have evaluated the behavior, morphology, physiology, genetic diversity, and reproductive success of hatchery and wild steelhead. 20,000 steelhead have been released from AFTC yearly since 2003. Wild smolt production has not been effected. Hatchery and wild fish differ morphologically and physiologically. We have maintained genetic diversity among the broodstock and progeny. Hatchery returns have reproduced naturally. Hatchery and wild fish produced equivalent numbers of offspring.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>To meet Service goals and a NMFS BiOp, Abernathy Fish Technology Center (AFTC) staff are establishing a native broodstock of natural spawning steelhead to recover wild steelhead populations. The study is evaluating the effects of integrated hatchery practices on wild ESA populations for application throughout the Columbia River basin.</p> <p>The problem:</p> <p>Many hatchery programs for steelhead pose genetic or ecological risks to natural populations because those programs release or outplant fish from non-native stocks. As a result, the USFWS and the NOAA Fisheries have recommended a policy that discourages the use of non-native hatchery stocks and encourages development of native broodstocks.</p> <p>The objective:</p> <p>We are developing methods to produce hatchery fish that do not involve the use of ESA-listed adults that in turn will be used to</p>					
Expended	\$395251						
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.						
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)						
Primary Benefited Population	Not specified						
Plans	Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper) National Broodstock Policy and Implementation Guidelines						
Keyword	Fish Technology						
Need Number	N-002						
Partners	Washington Department of Fish and Wildlife (\$70000)						
<p>Accomplishments</p> <table border="1"> <tr> <td>Recovery Plan production tasks implemented (PART)</td> <td>1</td> </tr> <tr> <td>Number of Fishery Management Plan production tasks implemented (PART)</td> <td>3</td> </tr> <tr> <td>Number of techniques and culture technology</td> <td>3</td> </tr> </table>			Recovery Plan production tasks implemented (PART)	1	Number of Fishery Management Plan production tasks implemented (PART)	3	Number of techniques and culture technology
Recovery Plan production tasks implemented (PART)	1						
Number of Fishery Management Plan production tasks implemented (PART)	3						
Number of techniques and culture technology	3						

tools developed.		<p>develop a native broodstock. Results should produce a means to produce self-sustaining stocks of steelhead that have applicability for use in salmon recoveries throughout the Pacific Region.</p> <p>The method:</p> <p>We initiated our steelhead broodstock program by captively rearing wild juveniles to sexual maturity. 20,000 juveniles have been released from AFTC yearly since 2003. We have been monitoring hatchery and wild smolt and returning adult steelhead behavior, morphology, physiology, genetic diversity, and reproductive success since 2003.</p> <p>Further description:</p> <p>Five hundred naturally spawned juvenile steelhead from the locally adapted population were collected over 3 years (1999-2001). Progeny produced from these fish are being released, monitored, and evaluated. The number of wild steelhead smolts migrating out of the treatment (1) and control (2) creeks has been consistent among years. Emigration date between hatchery and wild fish were similar and did not vary among years. However, hatchery and wild steelhead differed morphologically and physiologically. After genotyping and parentage analysis it appears that we have been successful, thus far at maintaining genetic diversity among our broodstocks as well as within the progeny produced at the hatchery. In addition, the individuals that we have passed upstream of the hatchery have been able to reproduce naturally. To date it appears that wild fish produced equivalent numbers of offspring as hatchery fish.</p> <p>Ecological Physiology</p>
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1	

13210-A-025 - [Bioenergetics of Genetically Distinct Populations of Bull Trout in Relation to Fish Passage](#)

Facility	Abernathy Fish Technology Center	<p>Accomplishment Summary</p> <p>Respirometry equipment was built and successfully tested. Oxygen maximum consumption rate experiments on wild bull trout have been completed. Experiments to determine resting and active metabolic rates have been completed. Currently a final report is being compiled and should be available in late 2006.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Bull trout has been listed by the USFWS. As such it is imperative to determine and describe basic metabolic needs of bull trout for use in making management decisions, specifically on such issues as culvert design.</p> <p>The problem:</p> <p>Basic metabolic needs of bull trout are unknown thus making management decisions, specifically on such issues as culvert design difficult.</p> <p>The objective:</p> <p>We intend to determine the resting and active metabolic rate for wild bull trout at several temperatures and sizes and respective maximum consumption rates. In addition we intend to develop a bioenergetics model for wild bull trout using data on life history, swim speed, activity, and water temperature.</p> <p>The method:</p> <p>We have determined the resting and active metabolic rate for wild bull trout at several temperatures and sizes and respective</p>			
Expended	\$55591				
Objective	Utilize appropriate scientific and technologic tools in formulating and executing fishery management plans and policies.				
Primary Benefited Species	Bull trout (Salvelinus confluentus)				
Primary Benefited Population	Walla Walla River core area Bull Trout				
Plans	Bull Trout Draft Recovery Plan, Chapter 23				
Keyword	Fish Passage				
Need Number	N-002				
Partners	National Oceanic and Atmospheric Administration, Northwest Fisheries Science Center Oregon Fish and Wildlife Office U.S. Geological Survey, Columbia River Research Lab				
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> <tr> <td>Number of applied aquatic scientific and technologic tools shared with partners.</td> <td>1</td> </tr> </table>			Number of other Recovery Plan tasks implemented for T&E populations	1	Number of applied aquatic scientific and technologic tools shared with partners.
Number of other Recovery Plan tasks implemented for T&E populations	1				
Number of applied aquatic scientific and technologic tools shared with partners.	1				

maximum consumption rates. We have developed a bioenergetics model for wild bull trout using data on life history, swim speed, and activity, and water temperature.

Further description:

Annual report is currently being prepared and will be available late 2006.

Ecological Physiology

13210-A-033 - [Identification of Previously Unknown Lesions in White Sturgeon Liver.](#)

Facility	Abernathy Fish Technology Center	<p>Accomplishment Summary</p> <p>Manuscript on polycystic lesions in the liver of white sturgeon is in preparation to be submitted to the Journal of Aquatic Animal Health.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Very little is known about disease in white sturgeon. The lesions described in this study are a new pathology and seem to be 100% fatal for the fish that display them. Because some populations of sturgeon are endangered and other populations are in jeopardy, this pathology may have important consequences in recovery efforts.</p> <p>The problem:</p> <p>A new, polycystic lesion has been discovered in juvenile white sturgeon. This lesion appears to be 100% fatal in those fish that display the condition. This condition needs to be studied further and its origin determined.</p> <p>The objective:</p> <p>This study describes a new, polycystic lesion found in the liver and kidney of juvenile white sturgeon.</p> <p>The method:</p> <p>Infected sturgeon will be examine by histopathological techniques to describe the general nature of this lesion. Information gathered on this pathogen can be used in developing diagnostic techniques and treatment methods.</p>	
Expended	\$15660		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	White sturgeon (Acipenser transmontanus)		
Primary Benefited Population	Not specified		
Plans	U.S. Fish and Wildlife Service National Aquatic Animal Health Policy		
Keyword	Fish Health		
Need Number	N-002		
Partners	Dr. Charlie Smith (USFWS retired) Idaho FHC		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of applied aquatic scientific and technologic tools shared with partners.</td> <td>1</td> </tr> </table>			Number of applied aquatic scientific and technologic tools shared with partners.
Number of applied aquatic scientific and technologic tools shared with partners.	1		

Further description:

Pathology

In July 2003, Abernathy FTC staff noted that a number of juvenile white sturgeon had severely distended abdomens. Initial necropsy revealed a large, jelly-like mass in the peritoneal cavity of the fish. Histopathological samples were taken of the tumor and the mass was identified as a polycystic lesion of the liver. In order to detect transmissibility of the condition, samples of the tumor were prepared for injection into healthy fish. Infected fish were also cohabitated with healthy fish to determine horizontal transmission. None of the test groups showed any signs of the condition after 3 months of observation. This is a new, undescribed condition in white sturgeon and is believed to be a genetic anomaly. An oral presentation was delivered on this study at the 9th Biennial Fish Diagnosticians Conference in Biloxi, MS, with an additional poster presented at the Western Fish Disease Workshop in Juneau, AK, and at the Annual Meeting of the American Fisheries Society, Fish Health Section, Shepardstown, WV.

13210-A-039 - [Genetic and Geographic Origins of Threatened Bull Trout Trapped at Dams in the Clark Fork River, MT.](#)

Facility	Abernathy Fish Technology Center	<p>Accomplishment Summary</p> <p>Standardized genetic protocols were developed for identifying geographic origin of bull trout in the Lower Clark Fork River / Lake Pend Oreille. Fifty adults captured at the base of Cabinet Gorge Dam were genotyped in a rapid response mode as part of a selective passage program that involves three dams in the Clark Fork River Basin of ID and MT. This passage allows fish to reach their spawning grounds. 500 bull trout were genotyped to supplement the genetic baseline used to assigning fish.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Genetic information is used to assist with the selective passage of bull trout over three dams in the Clark Fork River Basin of Idaho and Montana. This passage allows fish to reach their spawning grounds. More fish spawning decreases the demographic risk of extinction for this bull trout core area.</p> <p>The problem:</p> <p>Bull trout are currently listed as threatened under the U.S. Endangered Species Act. In the Clark Fork River three large hydropower dams prevent upstream migration of adult fish back to their natal spawning areas. The reduction in the number of spawners reaching their natal streams has resulted in rapid population declines.</p> <p>The objective:</p> <p>To genetically identify the sub-basin of origin of trapped adults prior to their release downstream or passage upstream using a</p>
Expended	\$75285	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Bull trout (Salvelinus confluentus)	
Primary Benefited Population	Bull trout - Clark Fork (3) Cabinet Gorge Reservoir	
Plans	Chapter 3, Clark Fork River Recovery Unit, Montana, Idaho, and Washington. 285 p. U.S. Fish and Wildlife Service. Bull Trout (<i>Salvelinus confluentus</i>) Draft Recovery Plan. Portland, Oregon.	
Keyword	Genetics	
Need Number	N-002	
Partners	<p>Avista Corporation (\$10000)</p> <p>Confederated Salish Kootenai Tribes (\$5000)</p> <p>Idaho Fish and Game (\$5000)</p> <p>Montana Department of Fish, Wildlife & Parks (\$5000)</p> <p>Mountain Prairie Region Ecological Services Field Office (\$5000)</p>	

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	2
Number of applied aquatic scientific and technologic tools shared with partners.	1
Number of techniques and culture technology tools developed.	1

"rapid response" methodology.

The *method*:

This project identified and developed a suite of DNA markers to genetically identify the sub-basin (or population) of origin of bull trout trapped at the base of main stem dams during their upstream spawning migrations.

13210-A-042 - [Genetic Analysis of Hybridization between Bull Trout and Brook Trout in the Malheur River, OR](#)

Facility	Abernathy Fish Technology Center
Expended	\$9962
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Malheur River core area Bull trout
Plans	Bull Trout Draft Recovery Plan, Chapter 14 Bull Trout Recovery Plan, Ch 1 Introduction
Keyword	Genetics
Need Number	N-002
Partners	Burns Paiute Tribes of Oregon (\$5000)

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	2
Number of surveys conducted for aquatic invasive species baseline/trend information	1
Number of technical assistance requests fulfilled to support Tribal fish and wildlife conservation	1
Number of applied aquatic scientific and technologic tools shared with partners.	1
Number of techniques and culture technology	1

Accomplishment Summary

We used 13 genetic markers to document the presence of natural hybridization between threatened bull trout and introduced brook trout in three tributaries of the Malheur River, OR. These results will aid the Burns-Paiute Tribe in quantifying the impact of hybridization on bull trout recovery. Results were also used to enter four bull trout populations into the rangewide database allowing for a better understanding of evolutionary relationship of this core area to others over the species range.

Description

The importance to the Resource:

Working collaboratively with Burns Paiute Tribal biologists, this project provided genetic identification of species or hybrids from 300 trout collected from 3 creeks in the Malheur River Basin. Field identifications and genetic identifications of 15 hybrids were strongly concordant confirming that natural hybridization is occurring in the basin.

The problem:

Naturalized brook trout threaten the continued existence of bull trout via competition and potential natural hybridization. The impact of hybridization on these bull trout populations was unknown until this study was completed.

The objective:

To use genetic methods to characterize hybridization between bull and brook trout in Lake Creek, Meadow Creek, and Big Creek all tributaries to the Malheur River on the Burns-Paiute Indian Reservation in central Oregon.

tools developed.

The *method*:

A large number of candidate DNA loci were first tested for their ability to discriminate bull trout and brook trout. Three hundred fish were examined from three populations.

13210-A-044 - [Genetic Identification of Endangered Winter-Run Chinook Salmon in the Sacramento River, CA](#)

Facility	Abernathy Fish Technology Center
Expended	\$66000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Sacramento River Winter-Run Evolutionarily Significant Unit
Plans	National Broodstock Policy and Implementation Guidelines Proposed Recovery Plan for the Sacramento River Winter-run Chinook Salmon
Keyword	Genetics
Need Number	N-002
Partners	California Department of Fish and Game (\$30000) Coleman National Fish Hatchery (\$30000) Red Bluff Fish and Wildlife Office (\$30000)

Accomplishments

Number of Fishery Management Plan production tasks implemented (PART)	1
Number of applied aquatic scientific and technologic tools shared with partners.	1

Accomplishment Summary

A total of 500 natural origin adults and 384 salmon carcasses were genotyped using "rapid response" methodology to identify winter-run Chinook salmon. These results are critical for maintaining broodstock integrity and estimating abundance of endangered winter-run Chinook in the Sacramento River.

Description

The importance to the Resource:

Genetic verification of adults used in the NFH program is critical to the genetic integrity of the broodstock and species recovery. Genetic identifications are also performed on spawned-out carcasses retrieved from the Sacramento River to estimate levels of population abundance and recovery among natural spawners.

The problem:

Livingston Stone NFH, a conservation NFH, produces listed winter-run Chinook salmon. Adults are trapped for potential broodstock in the Sacramento River. Return timing of fall-run Chinook and spring-run Chinook overlap with winter-run Chinook and genetic information must be used to identify winter-run for broodstock and abundance estimates.

The objective:

DNA markers are used to distinguish endangered winter-run Chinook salmon from other "races" of Chinook salmon in the Sacramento River.

The method:

Number of techniques and culture technology tools developed.	1	Fin clips from each trapped adult are express mailed to the Abernathy FTC for "rapid response" genetic identification of run type. Genetic identifications are determined within 10 hours of receipt of tissues, and the results sent electronically to the NFH manager for broodstock selection and disposition.
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	2	
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	1	

13210-A-045 - [Genetic Monitoring of Threatened Hatchery and Natural Origin Steelhead in Battle Creek, CA](#)

Facility	Abernathy Fish Technology Center
Expended	\$44000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	California Central Valley Steelhead Distinct Population Segment (DPS)
Plans	Steelhead Restoration and Management Plan for California Endangered Species Act: Northern California ESU Steelhead
Keyword	Genetics
Need Number	N-002
Partners	Coleman National Fish Hatchery (\$5000) Red Bluff Fish and Wildlife Office (\$5000)

Accomplishments

Number of population assessments completed	1
Number of Fishery Management Plan production tasks implemented (PART)	1
Number of other Fishery Management Plan tasks implemented for populations of	1

Accomplishment Summary

Hatchery and natural origin steelhead passed upstream at the Coleman NFH were genotyped at a set of DNA loci. A total of 1800 adult steelhead have been genotyped. Relative reproductive success of the two groups will be determined via parentage analysis.

Description

The importance to the Resource:

The Battle Creek, CA, population of steelhead is listed as threatened as part of the Central Valley distinct population segment. The USFWS is genetically monitoring the natural reproductive success of natural and hatchery-origin steelhead in Battle Creek upstream from the Coleman NFH.

The problem:

Are hatchery-origin fish produced by Coleman NFH directly contributing to, or impeding, the recovery of the Battle Creek ESA listed stock?

The objective:

The study's goal is to assess the natural reproductive success and genetic contribution of both hatchery and natural origin adult steelhead to returning natural origin adults in Battle Creek.

The method:

All adults passed upstream are genotyped with a suite of DNA markers. All natural origin adults returning one generation later are also being genotyped. DNA based parentage analysis will allow for the determination of the natural spawning success and progeny return

management concern.		rates of all adults passed upstream to spawn naturally.
Number of applied aquatic scientific and technologic tools shared with partners.	1	
Number of techniques and culture technology tools developed.	1	

13210-A-049 - [Genetic Monitoring and Broodstock Management of Steelhead at the Eagle Creek NFH](#)

Facility	Abernathy Fish Technology Center
Expended	\$10000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	Clackamas River winter run steelhead
Plans	Eagle Creek NFH Winter Steelhead Hatchery and Genetic Management Plan 1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin.
Keyword	Genetics
Need Number	N-002
Partners	Columbia River Fisheries Program Office (\$10000) Eagle Creek National Fish Hatchery (\$500) Lower Columbia Fish Health Center (\$500)

Accomplishments

Number of population assessments completed	2
--	---

Accomplishment Summary

Genetic assignment tests were used to determine if Eagle Creek NFH steelhead trout are reproducing naturally in Eagle Creek. These findings will aid in the development of a genetic monitoring and broodstock management plan for steelhead at Eagle Creek NFH. This is the second year of a three year study. The first year of the study indicated the majority of the 200 natural-origin steelhead sampled were parented by the ESA listed native winter-run population.

Description

The importance to the Resource:

In the second year of a three year study, genetic assignment tests were used to determine the genetic impact of the Eagle Creek NFH fish on the ESA listed native winter-run steelhead. The information gathered from this project will aid managers with assessing genetic risks associated with maintaining the current broodstock at Eagle Creek NFH.

The problem:

The number of non-native Eagle Creek NFH steelhead spawning naturally in Eagle Creek is unknown. The NFH program is managed as a segregated program with the assumption that few, if any, hatchery steelhead spawn in the wild.

The objective:

Determine the reproductive success of Eagle Creek NFH steelhead in the wild.

The method:

Number of other Recovery Plan tasks implemented for T&E populations	2	Sixteen DNA markers and genetic assignment tests were used to determine if natural-origin juveniles were parented by hatchery or the ESA listed wild steelhead. A total of 200 juvenile and 50 adult steelhead were examined from five locations in the Eagle Creek basin.
Number of applied aquatic scientific and technologic tools shared with partners.	1	
Number of techniques and culture technology tools developed.	1	
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1	

13210-A-050 - [Genetic Distinction of Threatened Summer-Run and Winter-Run Steelhead in the Hood River, OR.](#)

Facility	Abernathy Fish Technology Center	<p>Accomplishment Summary</p> <p>A rapid response protocol was developed to identify summer and winter-run steelhead in the Hood River, OR. This protocol was used to identify 120 broodstock for the summer and winter-run hatchery programs. These results are critical for maintaining the integrity of these two ESA listed populations.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Two distinct races of steelhead are native to the Hood River, OR. Oregon Dept. of Fish & Wildlife hatchery broodstocks have been developed for winter and summer run steelhead trout to assist with recovery of these ESA-listed stocks and to support Hood River recreational and Tribal fisheries.</p> <p>The problem:</p> <p>Significant temporal overlap exists between summer and winter run steelhead when adults are trapped for broodstock. Consequently, the hatchery programs pose significant genetic risk of inadvertently crossbreeding adults from the two races.</p> <p>The objective:</p> <p>This project uses genetic markers to distinguish between summer-run and winter-run steelhead in the Hood River, OR, using a suite of DNA markers.</p> <p>The method:</p> <p>A set of genetic markers were isolated for their powers to distinguish individual fish of the two races. The genetic race of each of 120 adult</p>			
Expended	\$19071				
Objective	Develop and share applied aquatic scientific and technologic tools with partners.				
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)				
Primary Benefited Population	Hood River Winter Steelhead				
Plans	<p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin.</p>				
Keyword	Genetics				
Need Number	N-002				
Partners	<p>Confederated Tribes of The Warm Springs (\$10000)</p> <p>Oregon Department of Fish and Wildlife (\$10000)</p>				
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>4</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> </table>			Number of population assessments completed	4	Number of other Recovery Plan tasks implemented for T&E populations
Number of population assessments completed	4				
Number of other Recovery Plan tasks implemented for T&E populations	1				

Number of technical assistance requests fulfilled to support Tribal fish and wildlife conservation	2	fish trapped in the Hood River was genetically identified in a rapid response mode prior to spawning for broodstock. An additional 150 fish of "known" origin were added to the genetic baseline.
Number of applied aquatic scientific and technologic tools shared with partners.	1	
Number of techniques and culture technology tools developed.	1	
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1	

13210-A-052 - [Conservation Genetics of the Endangered Oregon Chub Over the Species Range](#)

Facility	Abernathy Fish Technology Center
Expended	\$9731
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Oregon chub (Oregonichthys crameri)
Primary Benefited Population	Not specified
Plans	Recovery Plan for the Oregon Chub (<i>Oregonichthys crameri</i>)
Keyword	Genetics
Need Number	N-002
Partners	Columbia River Fisheries Program Office (\$1000) Ecological Services (\$1000) Oregon Department of Fish and Wildlife (\$1000)

Accomplishments

Number of population assessments completed	21
Number of other Recovery Plan tasks implemented for T&E populations	3
Number of applied aquatic scientific and technologic tools shared with partners.	1

Accomplishment Summary

A range wide population genetics study was completed that included 21 populations of Oregon Chub. Fourteen DNA markers (microsatellite loci) were used to examine 1200 fish. This new genetic information will be used to estimate the level of inbreeding within populations, identify genetically distinct groups of Oregon chub, and identify historic migration patterns among the populations. Final report will be completed in FY07.

Description

The importance to the Resource:

Oregon chub are an endangered fish found only in the Willamette Valley of western Oregon. Currently, only 23 locations contain Oregon chub. Most of the remaining populations are isolated and contain low numbers of fish. This isolation and low abundance creates a high risk for demographic and genetic extinction.

The problem:

Currently new populations are being established and transfer of fish among populations is being considered. However, no genetic data are available on Oregon chub to help guide these important restoration efforts.

The objective:

This basic genetic information will allow us to estimate the level of inbreeding within populations, identify genetically distinct groups of Oregon chub, and identify historic migration patterns among the populations. These results will aid in the restoration of this highly endangered species.

The *method*:

Using 14 newly developed DNA markers, we determined the amount of within and among population genetic diversity present over the Oregon chub's range by examining at least 1200 fish from 21 populations.

13210-A-053 - [Evolutionary Genetic Relationships Between Threatened Foscett Springs and Warner Basin Speckled Dace](#)

Facility	Abernathy Fish Technology Center
Expended	\$8879
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Speckled dace (Rhinichthys osculus)
Primary Benefited Population	Speckled dace - Warner Basin and Alkali Subbasin
Plans	Recovery Plan for the Threatened and Rare Native Fishes of the Warner Basin and Alkali Subbasin: Warner sucker, Hutton tui chub, Foscett speckled dace.
Keyword	Genetics
Need Number	N-002
Partners	Ecological Services (\$1000)

Accomplishments

Number of population assessments completed	8
Number of applied aquatic scientific and technologic tools shared with partners.	1
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1

Accomplishment Summary

Evolutionary genetic relationships between threatened Foscett Springs speckled dace and speckled dace populations in the adjacent Warner and Goose Lake Basins were determined. 120 dace were examined.

Description

The importance to the Resource:

Foscett Spring speckled dace (*Rhinichthys osculus* ssp.) were listed as threatened in 1985 under the U.S. Endangered Species Act. It is an isolated population of speckled dace inhabiting Foscett Spring along the western margin of Coleman Lake, a hydrologically separated sub-basin approximately 10 km south of the Warner Basin in southeast Oregon.

The problem:

Coleman Lake became isolated hydrologically from the Warner Basin 12,000 years ago. Speckled dace is the only fish native to Foscett Springs. The close proximity of Coleman Lake and the Warner Basin raises questions regarding the amount of evolutionary genetic divergence between populations of speckled dace in those two basins.

The objective:

To determine if Foscett speckled dace be considered a distinct subspecies relative to the more abundant populations in the Warner Basin?

The method:

To test the null hypothesis that Foscett Spring

	<p>and Warner Basin populations of speckled dace have not diverged evolutionary from each other, we compared mtDNA sequences at the CytB and ND2 genes and resulting haplotype frequencies for 30 Foskett speckled dace to those of 100 speckled dace inhabiting the adjacent Warner and Goose Lake basins.</p>
--	---

13210-A-057 - [Development of Native Broodstock Techniques for Conservation, Harvest, and Recovery of Steelhead](#)

Facility	Abernathy Fish Technology Center
Expended	\$62468
Objective	Develop and share applied aquatic scientific and technologic tools with partners.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	lower Columbia River Steelhead
Plans	Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper) National Broodstock Policy and Implementation Guidelines
Keyword	Fish Technology
Need Number	N-002
Partners	Bonneville Power Administration Washington Department of Fish and Wildlife

Accomplishments

Recovery Plan production tasks implemented (PART)	1
Number of Fishery Management Plan production tasks implemented (PART)	3

Accomplishment Summary

New technologies will be developed for developing native, hatchery broodstock programs for steelhead that can provide fish for harvest and contribute to the recovery of naturally spawning populations

Description

The importance to the Resource:

To meet Service goals and a NMFS BiOp, Abernathy Fish Technology Center (AFTC) staff are establishing a native broodstock of natural spawning steelhead to recover wild steelhead populations. The study is evaluating the effects of integrated hatchery practices on wild ESA populations for application throughout the Columbia River basin.

The problem:

Many hatchery programs for steelhead pose genetic or ecological risks to natural populations because those programs release or outplant fish from non-native stocks. As a result, the USFWS and the NOAA Fisheries have recommended a policy that discourages the use of non-native hatchery stocks and encourages development of native broodstocks.

The objective:

We are developing methods to produce hatchery fish that do not involve the use of ESA-listed adults that in turn will be used to develop a native broodstock. Results should produce a means to produce self-sustaining stocks of steelhead that have applicability for use in salmon recoveries throughout the Pacific Region.

Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)

1

The *method*:

We initiated our steelhead broodstock program by captively rearing wild juveniles to sexual maturity. 20,000 juveniles have been released from AFTC yearly since 2003. We have been monitoring hatchery and wild smolt and returning adult steelhead behavior, morphology, physiology, genetic diversity, and reproductive success since 2003.

Further description:

Five hundred naturally spawned juvenile steelhead from the locally adapted population were collected over 3 years (1999-2001). Progeny produced from these fish are being released, monitored, and evaluated. The number of wild steelhead smolts migrating out of the treatment (1) and control (2) creeks has been consistent among years. Emigration date between hatchery and wild fish were similar and did not vary among years. However, hatchery and wild steelhead differed morphologically and physiologically. After genotyping and parentage analysis it appears that we have been successful, thus far at maintaining genetic diversity among our broodstocks as well as within the progeny produced at the hatchery. In addition, the individuals that we have passed upstream of the hatchery have been able to reproduce naturally. To date it appears that wild fish produced equivalent numbers of offspring as hatchery fish.

Ecological Physiology

13210-A-068 - [Genetic Identification of Species and Origin of Missouri and Yellowstone Rivers YOY Sturgeon.](#)

Facility	Abernathy Fish Technology Center
Expended	\$7133
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Pallid sturgeon (Scaphirhynchus albus)
Primary Benefited Population	RPA 1-3 Upper Missouri River per Recovery Plan (above Gavins Point) Pallid Sturgeon -
Plans	Pallid Sturgeon Recovery Plan
Keyword	Genetics
Need Number	N-002
Partners	Montana Department of Fish, Wildlife & Parks (\$20000) U.S. Geological Survey, Biological Resources Division (\$20000)

Accomplishments

Number of population assessments completed	2
Number of applied aquatic scientific and technologic tools shared with partners.	1
Number of techniques and culture technology tools developed.	1
Number of applied science and technology tasks implemented as prescribed by	6

Accomplishment Summary

Tissue samples from young-of-year sturgeon sampled in the Upper Missouri and Yellowstone Rivers during 2004 (78 individuals) and 2005 (179 individuals) were genetically classified as pallid sturgeon, shovelnose sturgeon, or hybrids. Fish were also classified as hatchery or natural origin based on genetic tagging information.

Description

The importance to the Resource:

Intensive sampling for young-of-year sturgeon in the Missouri River and Yellowstone River is occurring to quantify reproductive success of shovelnose sturgeon and pallid sturgeon. This study provides a genetic method for distinguishing larvae and young-of-year sturgeon as pallid sturgeon, shovelnose sturgeon, or hybrids.

The problem:

Accurate field and laboratory identification of young-of-year sturgeon as pallid sturgeon, shovelnose sturgeon, hybrids, hatchery or natural origin is difficult due to the close similarity of *Scaphirhynchus* sp., the small size (16 – 140 mm) of individuals, and incomplete development of several key characteristics of individuals at small sizes.

The objective:

Provide a genetic method for distinguishing larvae and young-of-year sturgeon as pallid sturgeon, shovelnose sturgeon, or hybrids. In addition, the genetic information will also allow of the origin of the fish to be determined (hatchery or natural).

Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	6	<p>The method:</p> <p>The DNA profiles at 17 microsatellite loci for unmarked YOY fish will be compared to those of natural pallid, shovelnose, and hatchery-spawned adults in the genetic database. Parentage and assignment based methods will be used to classify fish.</p>
--	---	---

13210-A-069 - [Developing a Genetic Baseline for Pend Oreille River Basin Bull Trout](#)

Facility	Abernathy Fish Technology Center
Expended	\$17931
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Pend Oreille Bull Trout
Plans	Chapter 3, Clark Fork River Recovery Unit, Montana, Idaho, and Washington. 285 p. U.S. Fish and Wildlife Service. Bull Trout (<i>Salvelinus confluentus</i>) Draft Recovery Plan. Portland, Oregon.
Keyword	Genetics
Need Number	N-002
Partners	Kalispel Tribe of Indians (\$25000) Washington Department of Fish and Wildlife (\$1000)

Accomplishments

Number of population assessments completed	6
Number of other Recovery Plan tasks implemented for T&E populations	2
Number of technical assistance requests	1

Accomplishment Summary

Kalispel Tribe of Indians and USFWS added 450 bull trout from the Pend Oreille River Basin to a genetic baseline to determine the geographic origins of bull trout trapped below Albeni Falls, Boundary or Cabinet Gorge Dams. Having these populations in the baseline allows for the transport of Lake Pend Oreille, Priest River, or Clark Fork River bull trout above Albeni Falls Dam, thereby allowing these fish the opportunity to reach their natal spawning grounds.

Description

The importance to the Resource:

The results of this study assists the Kalispel Tribe of Indians in their extensive bull trout recovery efforts in the Pend Oreille River Basin by allowing for a better understanding of the movement / habitat requirements of these populations and knowing the geographic origins of fish collected at the base of Albeni Falls Dam.

The problem:

Fish can pass downstream at Albeni Falls Dam but no upstream passage is provided. The geographic origins of adult bull trout found below Albeni Falls Dam during the fall spawning migration are unknown.

The objective:

Bull trout populations were added from the Pend Oreille River Basin (i.e., the Salmo and Priest River drainages) to the larger Clark Fork and Lake Pend Oreille genetic baseline to determine the source of bull trout trapped below Albeni Falls, Boundary or Cabinet Gorge Dams.

fulfilled to support Tribal fish and wildlife conservation		The <i>method</i>:
Number of applied aquatic scientific and technologic tools shared with partners.	1	
Number of techniques and culture technology tools developed.	1	
		<p>Abernathy FTC has developed microsatellite DNA markers for distinguishing Clark Fork River and Lake Pend Oreille bull trout populations. Fish from the Pend Oreille River Basin were added to this baseline. This allows biologists to transport captured fish into the appropriate region of the system so they can continue their spawning migrations.</p>
		Further description:

13210-A-070 - [Genetic Analysis of Kootenai River Basin Bull Trout in MT, ID and Canada](#)

Facility	Abernathy Fish Technology Center
Expended	\$16425
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Bull trout - Kootenai (4) Kootenai River
Plans	Bull trout recovery Plan, Ch. 4, Kootenai River Chapter 4, Kootenai River Recovery Unit, Oregon. 89 p. In: U.S. Fish and Wildlife Service. Bull Trout (<i>Salvelinus confluentus</i>) Draft Recovery Plan.
Keyword	Genetics
Need Number	N-002
Partners	Idaho Department of Fish and Game (\$1000) Montana Department of Fish, Wildlife & Parks (\$20000)

Accomplishments

Number of population assessments completed	15
Number of other Recovery Plan tasks implemented for T&E populations	1

Accomplishment Summary

Levels of genetic diversity were quantified within and among 15 bull trout populations from the Kootenai River Basin in MT, ID and Canada. 458 fish from the basin were entered in to a range wide genetic database for bull trout. A set of genetic markers was identified to assign fish of unknown origin captured within the basin to their population of origin. This population assignment tool will be used to determine the geographic origins of fish captured at the base of Libby Dam.

Description

The importance to the Resource:

The Kootenai River Sub-basin is an international watershed that encompasses parts of British Columbia (B.C), Montana, and Idaho. The river flows south within the Rocky Mountain Trench into Kooconusa Reservoir created by Libby Dam in MT. It contains an important metapopulation of bull trout.

The problem:

Upstream fish passage structures do not exist at Libby Dam. However, Skaar et al. (1996) documented downstream bull trout passage through the turbines at Libby Dam. This raises the possibility of sub-adult fish passing through the dam and not being able to return to their natal populations to spawn.

The objective:

Examine genetic diversity within and among 15 populations in the Kootenai R. basin to determine if genetic tests can be used to assign the geographic origins of adult bull trout collected at the base of Libby Dam during the fall spawning migration period.

Number of applied aquatic scientific and technologic tools shared with partners.	1	The method:
Number of techniques and culture technology tools developed.	1	
		<p>Montana FWP collected approximately 30 juvenile bull trout tissue samples from 15 tributaries located in British Columbia and Montana for analysis at 12 microsatellite loci to develop a noninvasive genetic technique to determine the geographic or genetic origin of bull trout located below Libby Dam and Kootenai Falls.</p>

13210-A-071 - [Genetic Stock Identification of Adult Spring/Summer Chinook Salmon at Lower Granite Dam](#)

Facility	Abernathy Fish Technology Center	<p>Accomplishment Summary</p> <p>A joint project was initiated to determine the feasibility of using genetic mixture analysis to estimate natural and hatchery contribution to the Snake River aggregate escapement at Lower Granite Dam (LGD) in Idaho. 1000 fish were genotyped at 13 microsatellite loci. A power analysis will be conducted in FY07 to determine the resolution of the mixture analysis and to determine if 1000 fish is sufficient to represent the total composition of hatchery and natural populations.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Population level abundance is an essential component for monitoring the effects of harvest, habitat restoration programs, or recovery programs. We tested the ability to use genetic markers to estimate Chinook salmon population proportions precisely and accurately from mixed-stock samples collected at Lower Granite Dam on the Snake River, ID.</p> <p>The problem:</p> <p>Currently managers rely on coded wire tag program (CWT) and redd counts to estimate population abundance of endangered Chinook salmon populations in the Snake River. These methods have serious limitations for monitoring wild stocks and within river harvest rates.</p> <p>The objective:</p> <p>Develop genetic based methods to assign mixtures of fish back to their geographic origins in the Snake River.</p> <p>The method:</p>
Expended	\$40000	
Objective	Utilize appropriate scientific and technologic tools in formulating and executing fishery management plans and policies.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Snake River Spring/Summer Chinook ESU	
Plans	Lower Snake River Compensation Plan 2000 NMFS FCRPS Biological Opinion - December 21, 2000 1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin.	
Keyword	Genetics	
Need Number	N-002	
Partners	Columbia River Inter Tribal Fish Commission (\$60000) Idaho Fish and Game (\$30000) Lower Snake River Compensation Plan (\$2000) National Oceanic and Atmospheric Administration, Northwest Fisheries Science	

	Center (\$60000)	<p>Genetic mixture analysis was used to estimate natural and hatchery contribution to the Snake River aggregate escapement at LGD. Scales taken from stratified-random sample of Chinook at LGD (n=1000) will were genotyped at 13 microsatellite loci. Fish were also aged to determine the population composition and age structure of the aggregate run.</p>
<p>Accomplishments</p>		
<p>Number of other Recovery Plan tasks implemented for T&E populations</p>	<p>1</p>	
<p>Number of mitigation tasks implemented as prescribed in approved plans. (PART)</p>	<p>1</p>	

13210-A-072 - [Genetic Analysis of Hybridization Between Bull and Brook Trout in the Swan River Basin, Montana.](#)

Facility	Abernathy Fish Technology Center
Expended	\$3825
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Bull trout - Clark Fork (3) Swan Lake
Plans	Chapter 3, Clark Fork River Recovery Unit, Montana, Idaho, and Washington. 285 p. U.S. Fish and Wildlife Service. Bull Trout (<i>Salvelinus confluentus</i>) Draft Recovery Plan. Portland, Oregon.
Keyword	Genetics
Need Number	N-002
Partners	Ecological Services, Region 6 (\$5000) Montana Department of Fish, Wildlife & Parks (\$5000) U. S. Forest Service (\$5000)

Accomplishments

Number of population assessments completed	3
Number of other Recovery Plan tasks	1

Accomplishment Summary

Genetic analysis of hybridization between bull and brook trout was initiated in three creeks located in the Swan River Basin, Montana. Fin clips were collected from 375 fish. Genetic identification of each fish as bull, brook or hybrid will be accomplished in FY07. Field and genetic identifications will be compared with the hope of developing a field protocol for the identification of hybrids.

Description

The importance to the Resource:

Bull trout are native to Swan Lake and the Swan River drainage in Montana and have historically represented one of the healthiest remaining populations of the species anywhere across the range. Hybridization between bull trout and non-native brook trout represents one of the potential factors responsible for decline of bull trout in the basin.

The problem:

More information is needed on the system wide implications of bull trout x brook trout hybridization within the Swan River drainage.

The objective:

Examine distribution and abundance of bull trout, brook trout, and hybrids. Genetic and field identifications will be compared with the hope of developing a field identification protocol for the identification of hybrids.

The method:

13 microsatellite loci will be used to distinguish bull trout, brook trout, and individuals of hybrid

implemented for T&E populations		ancestry. A photo box and digital photos were used to document the physical appearance of all fish sampled. Long-term population index sites were sampled to obtain population estimates. Fish from three creeks were examined (n=125/creek).
Number of applied aquatic scientific and technologic tools shared with partners.	1	
Number of techniques and culture technology tools developed.	1	

13210-A-074 - [Evaluation of Steelhead Egg Box Outplanting via Parentage Analysis](#)

Facility	Abernathy Fish Technology Center
Expended	\$28293
Objective	Provide technical assistance to Tribes.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	Salmon River upper mainstem.
Plans	1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin. Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)
Keyword	Genetics
Need Number	N-002
Partners	Shoshone-Bannock Tribes (\$20000)

Accomplishments

Number of population assessments completed	1
Recovery Plan production tasks implemented (PART)	1
Number of technical assistance requests fulfilled to support Tribal fish and wildlife conservation	1

Accomplishment Summary

A study plan was developed and samples collected to evaluate steelhead trout egg hatch-box supplementation activity on Shoshone-Bannock Tribal land in the Yankee Fork of the Salmon River in Idaho. In FY07, genetic parentage analysis will be used to evaluate the proportion on 1+ steelhead in the Yankee Fork that were egg box origin or natural origin. In future years, the same process will be used to identify the proportion of unmarked / tagged returning adults that were egg-box outplants.

Description

The importance to the Resource:

Steelhead trout are a cultural, social, and subsistence based resource of historical significance for the Shoshone-Bannock Tribes. Each year the tribe outplants over 100,000 steelhead eggs into the Yankee Fork. Genetic marking of the outplanted eggs will allow for an evaluation of the survival of these fish to the smolt and adult stages.

The problem:

Because fish outplanted as eggs have not yet developed into fish they cannot be physically marked / tagged which means the outplanted fish cannot be differentiated from natural-origin fish. The inability to differentiate these two groups has limited information about the contribution of the egg outplant program to the population and fishery.

The objective:

Develop a genetic tagging protocol for hatchery origin steelhead trout outplanted as eggs into the Yankee Fork River of the Salmon River in

Number of applied aquatic scientific and technologic tools shared with partners.	1	Idaho.
Number of techniques and culture technology tools developed.	1	
		<p>The method:</p> <p>The method uses DNA markers to "tag" all released egg box fish by DNA-typing their parents. "DNA tags" are recovered from sampled fish by removing a very small piece of fin tissue and then processing the DNA in a laboratory to determine origin (egg box or natural) via parentage analysis.</p>

13210-A-094 - [Population Structure and Genetic Characteristics of Summer Steelhead in the Deschutes River, Oregon](#)

Facility	Abernathy Fish Technology Center	<p>Accomplishment Summary</p> <p>A four year genetic project was initiated with CRFPO to assess the population structure of summer steelhead trout in the Deschutes River and potential impact from out-of basin hatchery strays. 800 steelhead or redband trout were genotyped from 17 locations in the basin. Results of this work are critical to monitoring & evaluation projects of natural populations and questions associated with hatchery operations and impacts to the Deschutes basin native fish community.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>In identifying independent populations of ESA listed steelhead in the Deschutes River basin the Interior Columbia River Technical Recovery Team identified a number of important information gaps that needed to be addressed for effective steelhead trout management and recovery. This project will address those gaps.</p> <p>The problem:</p> <p>Limited information exists on the genetic differences between steelhead occupying the tributaries on the east and west sides of the lower Deschutes River below the Pelton Dam complex. Over half of the returning steelhead to the system have been out of basin strays and little is known about the reproductive success of these fish in the basin.</p> <p>The objective:</p> <p>Describe population structure and genetic variability among steelhead occupying tributaries and the main stem downstream of the Pelton Round Butte Dam, evaluate the</p>
Expended	\$44870	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)	
Primary Benefited Population	Deschutes River East Side Tributaries Steelhead	
Plans	<p>1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin.</p> <p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p>	
Keyword	Genetics	
Need Number	N-002	
Partners	<p>Columbia River Fisheries Program Office (\$23000)</p> <p>Columbia River Inter Tribal Fish Commission (\$10000)</p> <p>Confederated Tribes of The Warm Springs (\$20000)</p> <p>National Oceanic and Atmospheric Administration, Northwest Fisheries Science Center (\$5000)</p>	

Oregon Department of
Fish and Wildlife (\$20000)

Accomplishments

Number of population assessments completed	17
Number of other Recovery Plan tasks implemented for T&E populations	4
Number of technical assistance requests fulfilled to support Tribal fish and wildlife conservation	1
Number of applied aquatic scientific and technologic tools shared with partners.	1
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1

effect of out-of-basin strays on natural populations, and help select a broodstock source for reintroducing steelhead to currently inaccessible portions of the middle and upper basin.

The *method*:

Steelhead and redband trout will be genotyped at 13 microsatellite loci from over 17 locations in the basin. Stray fish will be sampled at the Shears Falls trap. Genetic population structure will be determined and mixture analysis will be used to determine the genetic contribution of stray fish to the natural populations.

13210-A-097 - [Conservation Genetics of Bull Trout on the Flathead Indian Reservation, MT](#)

Facility	Abernathy Fish Technology Center	<p>Accomplishment Summary</p> <p>One hundred and twelve bull trout samples from the Jocko River and Mission Creek basins on the Flathead Indian Reservation in MT. Samples are currently being analyzed to determine population structure and identification of source of unknown individual fish.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Confederated Salish Kootenai Tribal biologists have restored bull trout areas on the Flathead Reservation lands by removing non-native brook trout and improving the physical habitat. The goal of this effort is to reintroduce bull trout into many of these restored areas.</p> <p>The problem:</p> <p>Genetic data are needed to aid in the identification of appropriate source populations for these reintroductions.</p> <p>The objective:</p> <p>Determine genetic relationships among bull trout populations on tribal lands to guide the selection of populations for transport into the restored habitats.</p> <p>The method:</p> <p>We used DNA markers to identify the genetic relationships among bull trout populations within the Reservation. DNA markers were also used to eliminate the transfer of bull / brook hybrid trout.</p>					
Expended	\$7970						
Objective	Provide technical assistance to Tribes.						
Primary Benefited Species	Bull trout (Salvelinus confluentus)						
Primary Benefited Population	Bull trout - Clark Fork River 3 (Flathead River to Thompson Falls Dam)						
Plans	Chapter 3, Clark Fork River Recovery Unit, Montana, Idaho, and Washington. 285 p. U.S. Fish and Wildlife Service. Bull Trout (<i>Salvelinus confluentus</i>) Draft Recovery Plan. Portland, Oregon.						
Keyword	Genetics						
Need Number	N-002						
Partners	Avista Corporation (\$70000) Confederated Salish Kootenai Tribes (\$30000) Montana Department of Fish, Wildlife & Parks (\$5000)						
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>4</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>2</td> </tr> <tr> <td>Number of technical assistance requests</td> <td>1</td> </tr> </table>		Number of population assessments completed	4	Number of other Recovery Plan tasks implemented for T&E populations	2	Number of technical assistance requests	1
Number of population assessments completed	4						
Number of other Recovery Plan tasks implemented for T&E populations	2						
Number of technical assistance requests	1						

fulfilled to support Tribal fish and wildlife conservation		
Number of applied aquatic scientific and technologic tools shared with partners.	1	

13310-A-104 - [Assisting with Endangered Species Act Consultation and Habitat Conservation Plan Development](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Provided technical guidance to ESA consultations and HCP development</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Section Seven Consultation under the ESA is a process that is intended to reduce or eliminate impact to listed species from the implementation of Federal actions. Habitat Conservation Plans implement a similar process for non-Federal actions.</p> <p>The problem:</p> <p>The Federal Government funds thousands of activities throughout the U.S. When activities are conducted in areas where listed species are present, there is some potential for harm to the species as projects and programs are implemented.</p> <p>The objective:</p> <p>Technical knowledge of a variety of fish biology issues, and technical information on specific populations is necessary to develop effective mitigation/conservation measures for listed species.</p> <p>The method:</p> <p>The fisheries program office lends staff expertise on fish and fisheries issues to ecological services, to assist with conducting section seven and developing habitat conservation plans.</p> <p>Further description:</p>
Expended	\$22941	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Bull trout (Salvelinus confluentus)	
Primary Benefited Population	Not specified	
Plans	<p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>2000 FWS Biological Opinion - Effects to Listed Species from Operations of the Federal Columbia River Power System</p> <p>Bull Trout Recovery Plan, Ch 1 Introduction</p> <p>Recovery Plan for the Oregon Chub (<i>Oregonichthys crameri</i>)</p> <p>Bull Trout Draft Recovery Plan, Chapter 12</p> <p>Strategic Plan for Conservation of Fish and Wildlife Service Trust Resources in the Central Gulf Ecosystem</p>	
Keyword	Recovery	
Need	N-002	

Number		
Partners		
Accomplishments		
Number of population assessments completed	6	Columbia River Fisheries Program Office staff play a key role in the consultation process for the Service concerning fisheries and production activities in the Columbia River Basin, as well as participating in the status review during the listing process. With the numerous Endangered Species Act (ESA) listings in the last several years, Section 7 consultation activities have significantly increased. In particular, CRFPO staff served as the technical representative for the FWS during various consultations and the development of HCPs (i.e. in the Walla Walla River subbasin).
Number of other Recovery Plan tasks implemented for T&E populations	7	

13310-A-106 - [Bull Trout Recovery Planning](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Progress made in bull trout status review and recovery planning.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Bull trout remain listed as threatened and need to have a finalized recovery plan.</p> <p>The problem:</p> <p>The five year review process is still ongoing and finalizing the recovery plan has been put on hold pending the outcome of the review.</p> <p>Further description:</p>			
Expended	\$50000				
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.				
Primary Benefited Species	Bull trout (Salvelinus confluentus)				
Primary Benefited Population	Not specified				
Plans	Bull Trout Recovery Plan (Draft) Bull Trout Draft Recovery Plan, Chapter 10 Bull Trout Draft Recovery Plan, Chapter 6 Bull Trout Draft Recovery Plan, Chapter 7 Bull Trout Draft Recovery Plan, Chapter 9 Bull Trout Draft Recovery Plan, Chapter 20 Bull Trout Draft Recovery Plan, Chapter 12				
Keyword	Recovery				
Need Number	N-002				
Partners					
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>24</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>7</td> </tr> </table>			Number of population assessments completed	24	Number of other Recovery Plan tasks implemented for T&E populations
Number of population assessments completed	24				
Number of other Recovery Plan tasks implemented for T&E populations	7				

13310-A-110 - [Columbia Basin Mainstem Fish Passage Coordination Activities](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Represented the Fish and Wildlife Service on fish passage issues in the Columbia River Basin by participating in numerous regional interagency forums that address the recovery of listed fish species. Our technical expertise helps ensure adequate passage for both listed and un-listed stocks.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Columbia River Fisheries Program Office (CRFPO) serves as the focal point for FWS activities related to fish passage issues in the Columbia/Snake River Basin. The CRFPO coordinates fish passage issues and FWS responses to issues that affect Service operations or responsibilities through several regional forums in the Columbia/Snake Basin.</p> <p>The problem:</p> <p>In season, real time management decisions are the norm through regional Columbia Basin interagency forums that include the Fish Passage Advisory Committee, Implementation Team, Technical Management Team, System Configuration Team, Water Quality Team, Fish Passage Operation and Maintenance Committee, and Study Review Work Group.</p> <p>The objective:</p> <p>Thw FWS, in conjunction with other state, tribal, and federal agencies must coordinate the needs, under law, of various listed and non-listed fish populations as the operation of the Federal Columbia River Power System impacts those populations</p> <p>The method:</p>
Expended	\$85000	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Not specified	
Plans	<p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>2000 NMFS FCRPS Biological Opinion - December 21, 2000</p> <p>2006 Fish Passage Implementation Plan (In accordance with the Court Order)</p> <p>2006 Fish Passage Plan - Corps of Engineers Projects</p> <p>2006 Water Management Plan</p> <p>Columbia River Basin Fish and Wildlife Program (NPPC 2000)</p>	
Keyword	Fish Passage	
Need Number	N-002	
Partners	Bonneville Power Administration	

Columbia River Inter Tribal Fish Commission
 Fish Passage Center
 Idaho Department of Fish and Game
 National Marine Fisheries Service
 Oregon Department of Fish and Wildlife
 U.S. Army Corps of Engineers
 U.S. Bureau of Reclamation
 Washington Department of Fish and Wildlife

Staff represent the FWS and their responsibilities and obligations at several multi-agency regional management fora to discuss data, coordinate, and reach consensus decisions, if possible, that affect daily and seasonal main-stem Federal Columbia River Power System operations as it impacts various ESA listed, and non-listed, fish populations.

Further description:

CRFPO input helps determine operations that allow for multiple uses as well as maintenance of significant trust resources. This includes: coordination of flow releases from Libby Dam for endangered Kootenai River white sturgeon spawning, with rearing flows for threatened bull trout, with flows for listed salmon and steelhead; scheduling releases of fish from Service hatcheries with requests for increased flows and spill at mainstem dams; coordinating flow releases for mainstem spawning fall chinook and chum.

Accomplishments

Number of population assessments completed	72
Number of other Recovery Plan tasks implemented for T&E populations	14
Number of other Fishery Management Plan tasks implemented for populations of management concern.	6
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	2

13310-A-111 - [Fish Passage Facilities Inspection Coordination Program](#)

Facility	Columbia River Fisheries Program Office
Expended	\$0
Objective	Identify the mitigation responsibilities of Federal agencies related to water projects.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Not specified
Plans	Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper) 2000 NMFS FCRPS Biological Opinion - December 21, 2000 Columbia River Basin Fish and Wildlife Program (NPPC 2000)
Keyword	Fish Passage
Need Number	N-002
Partners	Fish Passage Center National Oceanic and Atmospheric Administration, Mitchell Act (\$9846)

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	2
---	---

Accomplishment Summary

The Service provided funding to the Pacific States Marine Fisheries Commission to match the equal contributions of the other agencies for this program for the purpose of conducting fishway inspections at Columbia River mainstem dams.

Description

The importance to the Resource:

Since its inception in 1983, the Fish Passage Center has continuously had a program in effect to coordinate adult and juvenile passage facilities inspections. Since 1986, this program has been jointly funded by state and federal agencies through the Fish Passage Center budget.

The problem:

Adult and juvenile fish passage facilities at mainstem dams continuously must be inspected and monitored to ensure that they are functioning within defined operational criteria.

The objective:

The Inspection Coordinator is responsible for advising the fishery agencies and tribes and the Fish Passage Center Manager on fish passage relative to the operation and maintenance of adult and juvenile fish passage facilities in the mainstem Snake and Columbia Rivers.

The method:

The CRFPO assists with inspection and monitoring of passage facilities to assure efficient operation for passage and survival of

Number of other Fishery Management Plan tasks implemented for populations of management concern.	1	<p>juvenile and adult fish.</p> <p>Further description:</p> <p>The following agencies have historically equally supported this program: (1) National Marine Fisheries Service, (2) Idaho Department of Fish and Game, (3) Washington Department of Fish & Wildlife, (4) Oregon Department of Fish and Wildlife, and the (5) U.S. Fish and Wildlife Service.</p>
--	---	--

13310-A-123 - [Comparative Survival Study Tagging and Evaluation Project](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Tagged and released 14,982 spring Chinook at Carson NFH and 51,955 spring Chinook at Dworshak NFH with Passive Integrated Transponder (PIT) tags and participated in systemwide survival studies.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The PIT tag study is a long term, basin wide program measuring smolt-to-adult survival for spring chinook salmon and steelhead from the Columbia River Basin. This program is also evaluating mitigation measures such as flow augmentation, spill, and fish transportation for the recovery of listed salmon stocks.</p> <p>The problem:</p> <p>There is significant uncertainty regarding the efficacy of juvenile fish transportation as a recovery implementation strategy. Therefore, the co-managers are engaged in a long term transportation study to better define the benefits and risks of this management strategy.</p> <p>The objective:</p> <p>The study addresses whether transportation of fish to below Bonneville Dam can compensate for the effect of the hydrosystem on juvenile survival rates and will allow comparison of survival rates of fish handled at the dams versus those that migrate without or with less handling.</p> <p>The method:</p> <p>CRFPO staff PIT tagged spring Chinook at Carson and Dworshak NFHs, worked with co-managers to develop simulation programs,</p>
Expended	\$21500	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Not specified	
Plans	<p>Columbia River Basin Fish and Wildlife Program (NPPC 2000)</p> <p>2000 NMFS FCRPS Biological Opinion - December 21, 2000</p> <p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p>	
Keyword	Monitoring and Assessment	
Need Number	N-002	
Partners	<p>Bonneville Power Administration (\$47322)</p> <p>Columbia River Inter Tribal Fish Commission</p> <p>Idaho Department of Fish and Game</p> <p>Oregon Department of Fish and Wildlife</p> <p>Washington Department of Fish and</p>	

Wildlife

Accomplishments

Number of population assessments completed	64
Number of other Recovery Plan tasks implemented for T&E populations	3
Number of other Fishery Management Plan tasks implemented for populations of management concern.	4
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	3

performed statistical analyses, helped prepare the 2005 CSS Annual Report, responded to comments on the draft Annual Report, and developed a proposal to evaluate the effectiveness of fall Chinook transportation.

Further description:

The objectives of the Comparative Survival Study are consistent with the Plan for Analyzing and Testing Hypotheses process and the Collaborative Systemwide Monitoring and Evaluation Project (CSMEP).

13310-A-147 - [Fish Passage, Water Quality, and TMDL's in the Columbia River Basin](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Represented the Service on technical fish passage and water quality issues in the mainstem Columbia River Basin by participating in regional forums that address the recovery of listed fish species. Helped assure adequate water quality and passage conditions while maintaining power production.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Columbia River Fisheries Program Office is the lead for fish passage and water management issues that address specific operations or programs of the Federal Columbia River Power System (FCRPS).</p> <p>The problem:</p> <p>Identify critical uncertainties of specific causes of ESA-listed and non-listed fish passage and survival problems related to the existence and the operation of the FCRPS, and associated infra-structure. Develop actions for specific data and remedial actions to protect the fish under treaty trust responsibilities and mandates of applicable laws.</p> <p>The objective:</p> <p>An interagency Regional Forum is responsible for implementation of actions required by the biological opinions of the National Marine Fisheries Service and the Fish and Wildlife Service for operation of the FCRPS.</p> <p>The method:</p> <p>Significant modeling activity has been conducted to develop alternative management strategies for streamflow and spill to improve</p>
Expended	\$105078	
Objective	Facilitate management of aquatic habitats on national and regional scales.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Not specified	
Plans	<p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>2000 NMFS FCRPS Biological Opinion - December 21, 2000</p> <p>2006 Fish Passage Implementation Plan (In accordance with the Court Order)</p> <p>2006 Water Management Plan</p> <p>Columbia River Basin Fish and Wildlife Program (NPPC 2000)</p>	
Keyword	Fish Passage	
Need Number	N-002	
Partners	<p>Bonneville Power Administration</p> <p>Columbia River Inter Tribal Fish Commission</p> <p>Environmental Protection Agency</p>	

National Marine
 Fisheries Service
 Oregon Department of
 Fish and Wildlife
 U.S. Army Corps of
 Engineers
 Washington
 Department of Fish and
 Wildlife

passage conditions and survival for
 anadromous fish.

Further description:

ESA listed bull trout, Kootenai River sturgeon,
 Snake River snails, and twelve stocks of
 salmon and steelhead continue to contribute to
 the complexity of fish passage issues in the
 Columbia River basin. The listings and
 associated biological opinions, and basin
 management plans require a constant and
 ongoing effort to balance the competing needs
 of the listed species, trust responsibilities,
 hydropower production, flood control,
 navigation, and irrigation.

Accomplishments

Number of population assessments completed	72
Number of other Recovery Plan tasks implemented for T&E populations	12
Number of other Fishery Management Plan tasks implemented for populations of management concern.	5
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	2

13310-A-151 - [Comprehensive Hatchery and Genetic Management Plan for Warm Springs National Fish Hatchery](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Hatchery and Genetic Management Plan drafted and submitted for Section 7 ESA consultation and identify hatchery reform.</p> <p>Description</p> <p>The importance to the Resource: Provide harvest to tribal and sport fisheries while protecting ESA listed fish.</p> <p>The problem: Fisheries and populations impacted by habitat, dams, and hatcheries.</p> <p>The objective: Hatcheries need to provide fisheries and protect ESA listed fish.</p> <p>The method: ESA Section 7 consultation through development of a Hatchery and Genetic Management Plan.</p> <p>Further description: The Service is working with the National Marine Fisheries Service (NMFS) and our co-managers to develop a conservation management approach for Columbia River hatcheries, which includes development of Hatchery and Genetic Management Plans (HGMPs) for all hatchery programs as a consultation mechanism to evaluate risks and benefits to listed species. Performance standards will be developed for each specific hatchery program. . The Service is also developing comprehensive management plans</p>
Expended	\$3569	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Not specified	
Plans	Warm Springs Hatchery and Genetic Management Plan (draft) Comprehensive Hatchery Management Plan- Warm Springs NFH 2000 NMFS FCRPS Biological Opinion - December 21, 2000	
Keyword	Management	
Need Number	N-002	
Partners	Abernathy Fish Technology Center Confederated Tribes of The Warm Springs Lower Columbia River Fish Health Center National Marine Fisheries Service Oregon Department of Fish and Wildlife Warm Springs National	

Fish Hatchery

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	1
Number of post stocking survival tasks met as prescribed by Fishery Management Plans, for hatchery propagated depleted species (PART)	1
number of marking and tagging targets met, as prescribed by Fishery management plans. (PART)	1
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	1

for all National Fish Hatcheries in Region One (CHMP). Together, these plans will integrate Service objectives and priorities with those of our co-managers and public to provide a foundation for hatchery reform and review. CRFPO staff will develop plans for Warm Springs, Eagle Creek, Carson, Little White, Willard and Spring Creek National Fish Hatcheries. This project is shared with the above mentioned National Fish Hatcheries, Abernathy Fish Technology Center, and Lower Columbia River Fish Health Center.

13310-A-152 - [Walla Walla River Bull Trout Recovery Efforts](#)

Facility	Columbia River Fisheries Program Office
Expended	\$73923
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Walla Walla River core area Bull Trout
Plans	Bull Trout Draft Recovery Plan, Chapter 10 Bull Trout Recovery Plan (Draft)
Keyword	Recovery
Need Number	N-002
Partners	Oregon Department of Fish and Wildlife (\$2000) Umatilla Tribe (\$2000) Upper Columbia Fish and Wildlife Office Walla Walla Basin Watershed Council Washington Department of Fish and Wildlife (\$2000)

Accomplishments

Number of miles of in-stream habitat assessed	18.0
Number of other Recovery Plan tasks	5

Accomplishment Summary

Continued work to develop habitat suitability criteria for spawning and rearing bull trout in the Walla Walla River, and to refine suitable water temperature criteria. Habitat and temperature criteria will allow development of more realistic instream flows to help recover bull trout. Habitat suitability model validation began during 2006.

Description

The importance to the Resource:

Bull trout are currently listed as threatened. Development of habitat suitability models will assist in the recovery of bull trout.

The problem:

Inadequate instream flows occur throughout the Walla Walla basin, primarily as a result of irrigation withdrawals.

The objective:

This project is designed to provide the technical data to improve conditions for ESA-listed bull trout in the Walla Walla basin to make progress towards recovery and delisting.

The method:

A probabilistic regression model is being developed to identify suitable habitat for spawning and rearing bull trout. Once suitable habitat is identified, alterations to flow can be modeled and the resulting affects on useable habitat can be estimated following the instream flow methodology.

Further description:

implemented for T&E populations		The habitat criteria currently being developed are required to define the physical conditions bull trout need to maintain stable populations, and to develop instream flow recommendations that will assist recovery. Data indicate that current water temperature criteria may not capture the conditions bull trout will use. This could result in elimination of suitable areas from restoration and instream flow development. Results of this work could actually expand the possible distribution of bull trout as a function of temperature conditions and allow us to determine instream flows to provide the necessary physical habitat.
Number of applied aquatic scientific and technologic tools shared with partners.	2	

13310-A-153 - [Subbasin Planning Activities in the Columbia River basin](#)

Facility	Columbia River Fisheries Program Office
Expended	\$121507
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Not specified
Plans	Lower Columbia Salmon Recovery and Subbasin Plan Columbia Estuary Province Sub-basin Plans Columbia River Basin Fish and Wildlife Program (NPPC 2000)
Keyword	Recovery
Need Number	N-002
Partners	Bonneville Power Administration Lower Columbia River Fish Recovery Board Northwest Power and Conservation Council Oregon Department of Fish and Wildlife

Accomplishments

Number of population assessments completed	50
--	----

Accomplishment Summary

Provided technical assistance implementing subbasin plans, through assisting with project reviews submittals for fish and wildlife program funding at subbasin, State, and regional levels. In addition, staff represent the Service on advisory groups for implementation and monitoring subbasin plan activities.

Description

The importance to the Resource:

Through subbasin plans, the Northwest Power and Conservation Council identifies projects for funding under the fish and wildlife program. These projects are important to provide biological information on listed species of salmon (primarily) and resident species (to a lesser degree).

The problem:

Installing and operating the system of Federal Dams throughout the Columbia River Basin, in conjunction with other habitat altering activities from a range of sources, and the potential impact of climate change on habitat and hydrology, has decimated fish and some wildlife populations throughout the Columbia Basin.

The objective:

The Fish and Wildlife program is supposed to divert funds derived from marketing power at the Federal Dams, to projects and programs that mitigate impacts from installing and operating the system on fish and wildlife populations in the Columbia Basin.

The method:

Through a planning process, subbasin plans are supposed to identify conditions and factors that limit fish and wildlife populations in the Columbia Basin, and identify measures, where possible, to correct these conditions or address specific factors for decline. Present efforts are to implement plan recommendations.

Further description:

This project provides data and information on current restoration and monitoring activities and provide guidance for future restoration activities for the sub-basins in the Columbia River Gorge, Columbia River Estuary, Lower Columbia River, and Columbia Plateau provinces. Plans to recover Columbia Basin salmon and steelhead, the NMFS and FWS Biological Opinions on the Federal Columbia River Power System, and the Northwest Power and Conservation Council's (NPCC's) Fish and Wildlife Program all require the completion of sub-basin plans. In concept, subbasin plans will help integrate and guide recovery efforts for many species. A primary focus of the CRFPO was to try and ensure that subbasin plans contained elements that are necessary for bull trout recovery as well as include measures for all species under FWS jurisdiction, particularly those which are imperiled. CRFPO assisted with the development of 17 subbasin plans. CRFPO is now participating in the implementation phase of the completed subbasin plan in the Lower Columbia River Area, through the Technical Advisory Committee, and Recovery Steering Committee

13310-A-154 - [Salmon Technical Recovery Team Participation](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Accomplishment: Participated in the National Marine Fisheries Service Interior Columbia Basin and Lower Columbia/Willamette Technical Recovery Team (TRT) and assisted in developing viability criteria, status assessments, gap analysis, and limiting factors analysis. Developed reports for viability criteria and gap analysis. Reviewed regional recovery plans for consistency with TRT guidance.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Columbia, was once the most productive river for Pacific salmon in North America; currently, however, there are 13 ESUs of salmon listed under the Endangered Species Act (ESA). In addition to their listing and economic value, salmon are an ecologically-important. The region needs technical criteria to guide for recovery of these populations.</p> <p>The problem:</p> <p>The region has implemented one of the largest, most administratively complex, and costly (~150 million dollars per year) fisheries restoration programs in the world. Given the listed status for 13 ESUs, and the complex and confounding nature of impacts to these populations, providing consistent guidance for recovery measures is a difficult task</p> <p>The objective:</p> <p>This project provided information and analysis required by the NOAA Fisheries to develop recovery plans for listed salmon in the interior and lower Columbia River. The criteria and evaluation process that were developed through this project will ensure that recovery</p>
Expended	\$90864	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Not specified	
Plans	<p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>Federal Columbia River Power System 2002 Biological Opinion</p> <p>Columbia River Basin Fish and Wildlife Program (NPPC 2000)</p>	
Keyword	Recovery	
Need Number	N-002	
Partners	<p>Columbia River Inter Tribal Fish Commission</p> <p>Idaho Department of Fish and Game</p> <p>National Marine Fisheries Service</p> <p>Oregon Department of Fish and Wildlife</p> <p>U. S. Forest Service</p> <p>University of Montana</p> <p>Washington</p>	

Department of Fish and
Wildlife

Accomplishments

Number of population assessments completed	134
Number of other Recovery Plan tasks implemented for T&E populations	6
Number of other Fishery Management Plan tasks implemented for populations of management concern.	3
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	1

measures can be evaluated against a consistent set of benchmarks for recovery.

The method:

Our staff provided technical expertise to the Technical Recovery Teams in the following areas: 1) population identification; 2) delisting criteria; 3) habitat/fish productivity relationships; 4) salmon limiting factor analysis; 5) hatchery evaluations; 6) monitoring and evaluation design, and 7) estimating survival gaps.

Further description:

We provided information and analysis required by the NMFS to develop recovery plans for listed salmon in the interior and lower Columbia River. . Our staff provided technical expertise to the Interior and Lower Columbia/Willamette (LCW) Technical Recovery Teams in the following areas: 1) population identification; 2) delisting criteria; 3) habitat/fish productivity relationships; 4) salmon limiting factor analysis; 5) hatchery evaluations; and 6) monitoring and evaluation design. The goal is to develop a sound recovery plan for Columbia River listed salmon. The CRFPO was fully engaged in both TRTs and worked on population identification for Chinook and steelhead in the Interior, a Viability Report for populations in the Interior, application of viability criteria to assess population status in LCW, and reviewed subbasin plans relative to viability criteria.. In addition we reviewed a number of regional recovery plans with respect to viability criteria. The Interior team has begun developing models to assess limiting factors relative to viability criteria. Also, the team is developing methodologies to intergrate the population analyses for an ESU. We developed a modeling system to estimate survival gaps

13310-A-166 - [Evaluate Factors Limiting Columbia River Gorge Chum Salmon Populations](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Estimated abundance, timing, and characteristics of adult and juvenile chum salmon in Hardy Creek and Hamilton Springs; monitored early juveniles using emergence traps.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Chum salmon, which are listed as threatened under the Endangered Species Act, consistently spawn in a limited number of areas and tributaries in the Columbia River basin. Suitable spawning habitat in one such tributary, Hardy Creek, is entirely located on Pierce National Wildlife Refuge.</p> <p>The problem:</p> <p>Factors limiting Chum salmon abundance in tributaries of Pierce National Wildlife Refuge are currently unknown. This information is needed to direct habitat restoration efforts or habitat modifications on refuge property</p> <p>The objective:</p> <p>Objective of this work is to develop a better understanding of chum salmon life history requirements so that opportunities to improve production through habitat restoration or creation may be assessed (e.g., evaluating the potential contribution of the artificial spawning channel at Pierce NWR).</p> <p>The method:</p> <p>Combination of fish abundance (spawning adults, migrating fry) and habitat parameter monitoring (temperature, dissolved oxygen, substrate composition) will be used to a</p>	
Expended	\$0		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	Chum salmon (Oncorhynchus keta)		
Primary Benefited Population	Lower Gorge Chum Salmon		
Plans	Federal Columbia River Power System 2002 Biological Opinion Columbia Gorge Subbasin Plan Lower Columbia Salmon Recovery And Fish & Wildlife Subbasin Plan: Volume II, Chapter A – Lower Columbia Mainstem and Estuary for Washington State - 2004		
Keyword	Monitoring and Assessment		
Need Number	N-002		
Partners	Bonneville Power Administration (\$263888) Pierce National Wildlife Refuge		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of habitat assessments completed</td> <td>1.0</td> </tr> </table>			Number of habitat assessments completed
Number of habitat assessments completed	1.0		

Number of population assessments completed	3	develop habitat suitability indices.
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1	
		<p>Further description:</p>
		<p>The CRFPO has monitored adult and juvenile chum salmon in Hardy Creek since 1997, and began monitoring adult and juvenile chum salmon in Hamilton Springs and adult salmon movement in the Columbia River in 1999. The goal of the project is to provide a better understanding of life history requirements and factors affecting chum salmon in the Columbia River Gorge, and investigate approaches to increase spawning habitat. Objectives of the project are: 1) Assess movement of adult chum salmon among three spawning areas (Hamilton Springs, Hardy Creek, and the mainstem Columbia River); 2) Determine abundance and biological characteristics of adult chum salmon; 3) Estimate chum smolt abundance in Hardy Creek, Hardy Creek Spawning Channel and Hamilton Springs; and 4) Evaluate habitat parameters associated with chum salmon spawning success. All work conducted at Hardy Creek and the constructed spawning channel is located on Pierce National Wildlife Refuge. The project is consistent with action agency commitments for implementation of the 2004 FCRPS BiOp and monitoring recommended in the Lower Columbia River Subbasin Plan. The project receives funding from the Bonneville Power Administration.</p>

13310-A-174 - [Bull Trout Population assessment of viability and demographic parameters for guiding recovery.](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Continued population assessment of bull trout focusing on quantifying key demographics, including fish density and distribution, growth, survival, movement, and population size. Also, assessment efforts expanded into the North Fork John Day basin, and bull trout genetic assessments continued.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Bull Trout are listed throughout the coterminous United States with populations demonstrating a wide range in population abundance, structure, demography, and vital rates. There is a need to 1) finalize a recovery plan for this wide ranging species with measurable recovery criteria, and 2) develop an associated monitoring and evaluation plan.</p> <p>The problem:</p> <p>Although bull trout are listed, quantitative measures of population viability criteria (e.g., distribution, abundance, and trend) are lacking, and little information exists for key demographic parameters (structure, movement, survival and growth) to identify limiting factors, set recovery benchmarks, and evaluate responses to proposed measures.</p> <p>The objective:</p> <p>Evaluate population viability through measurement of population distribution, abundance, and trend. Provide information for identifying recovery benchmarks and limiting factors through measurement of key vital rates and parameters including movement, growth, and survival. Evaluate strategies for M&E</p>
Expended	\$230785	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Bull trout (Salvelinus confluentus)	
Primary Benefited Population	Walla Walla River core area Bull Trout	
Plans	<p>Bull Trout Recovery Plan (Draft)</p> <p>Bull Trout Draft Recovery Plan, Chapter 9</p> <p>Bull Trout Draft Recovery Plan, Chapter 10</p> <p>Columbia River Basin Fish and Wildlife Program (NPPC 2000)</p>	
Keyword	Monitoring and Assessment	
Need Number	N-002	
Partners	<p>Environmental Protection Agency (\$5000)</p> <p>Oregon Department of Fish and Wildlife (\$8000)</p> <p>U.S. Geological Survey (\$28753)</p> <p>Umatilla Tribe</p> <p>Utah State University (\$24500)</p> <p>Walla Walla Basin Watershed Council</p>	

Accomplishments

Number of habitat assessments completed	1.0
Number of miles of in-stream habitat assessed	21.0
Number of miles of riparian habitat assessed	21.0
Number of population assessments completed	3
Number of other Recovery Plan tasks implemented for T&E populations	13
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	1

based on cost, effort and information gained.

The *method*:

Population assessment, including mark-recapture, was used for estimation of population and demographic parameters (e.g., size, trend and growth, survival). Study includes assessment of genetic structure using microsatellites as well as evaluation of habitat suitability, cues for migration, and the role of marine-derived nitrogen using isotopes.

Further description:

USGS Utah Coop. Unit and CRFPO conducted research in the South Fork Walla Walla, the North Fork Umatilla River, and the North Fork John Day River. Assessments included mark-recapture studies with innovative PIT tag techniques. We made robust estimates for population distribution, size, and trend and estimates of growth, survival, movement, and habitat suitability. Techniques provided guidance to the RMEG on sample design. Patch model assessment for monitoring and evaluation was evaluated. The potential for genetic differentiation among putative groups was assessed. There appears to be gene flow among fish categorized a priori as likely resident versus migratory, as well as among all spatial groupings, and data demonstrate one panmictic population. Isotopic tissue analysis combined with bioenergetics models provided an evaluation of formerly-abundant salmon in determining the diet and growth of bull trout. This indicated that growth rates are low and summer diets contain only a small portion of fish; bioenergetics simulations suggest a diet rich in salmon (as present historically) would increase bull trout growth potential considerably. The study contributed to the goal of providing a template for recovery planning region-wide.

13310-A-175 - [Columbia Basin Fish and Wildlife Authority and Habitat Initiative Activities](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Coordinated with partners to develop proposals for funding by the Western Native Trout Initiative. Initiated development of projects to assess tidal marsh restoration at NWRs, and secured funding from the National Fish and Wildlife Foundation to assess 88-acre marsh restoration project at a NWR. Participated on teams to review habitat restoration proposals to the Community Salmon Fund in Washington. Assessed restoration potential of 180-acre parcel purchased by Columbia Land Trust.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>National Wildlife Refuges and partner's lands in watersheds provide opportunities to manage and restore fishery, habitat, and other aquatic resources. Restoration actions on refuges and partner lands may contribute to recovering listed species, reversing population declines, and protecting habitats. Monitoring is needed to assess effects.</p> <p>The problem:</p> <p>Opportunities for fish and aquatic habitat restoration, as well as appropriate monitoring and assessment of restoration actions, exist at National Wildlife Refuges and associated watersheds. The lack of information concerning specific areas and personnel to perform coordination may hinder opportunities to implement restoration actions.</p> <p>The objective:</p> <p>The objective is to provide fisheries assistance concerning restoration, coordination, and</p>
Expended	\$68903	
Objective	Develop and improve long-term partnerships with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for aquatic resources.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Not specified	
Plans	Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper) National Fish Habitat Action Plan	
Keyword	Habitat	
Need Number	N-002	
Partners	Bandon Marsh National Wildlife Refuge Columbia Land Trust Confederated Tribes of Siletz Indians Ducks Unlimited Gee Creek Watershed Group Julia Butler Hansen National Wildlife Refuge (\$5000) Nestucca Bay National	

Wildlife Refuge
 Oregon Department of
 Fish and Wildlife
 Ridgefield National
 Wildlife Refuge
 The Nature
 Conservancy
 Washington Department
 of Fish and Wildlife

aquatic resources to a variety of partners (e.g., other Service programs, tribes, states, and other groups) that are implementing activities supportive of the National Fish Habitat Action Plan.

The method:

The CRFPO provided staff to establish working relationships with other service programs and partners involved in watershed planning and habitat restoration. These relationships allowed staff to develop proposals affecting aquatic habitat restoration, coordinate with those involved in restoration projects, and assist in watershed planning.

Further description:

The CRFPO has performed coordination for activities of several groups and processes involved in habitat restoration that is supportive of the NWPCF Fish and Wildlife Program and National Fish Habitat Action Plan. Staff participated on teams to review habitat restoration proposals for Washington's Community Salmon Fund, coordinated with ODFW to develop proposals for the Western Native Trout Initiative, and was successful in securing funding from the Northwest Native Fish Fund, administered by the National Fish and Wildlife Foundation. The funding is to assess a tidal marsh restoration project at Nestucca Bay NWR. The CRFPO is assessing habitat restoration potential of a 180-acre parcel of property adjacent to Julia Butler Hansen NWR that was acquired by the Columbia Land Trust. Staff are coordinating with multiple partners, including refuges, tribes, and conservation organizations, to assist in and develop comprehensive approaches for evaluating a 430-acre tidal marsh restoration project that is planned for implementation during 2009 at Bandon Marsh NWR, as well as

Accomplishments

Number of habitat assessments completed	1.0
Number of acres of wetland habitat assessed	180.0
Number of population assessments completed	35
Number of other Recovery Plan tasks implemented for T&E populations	1

	<p>assisting the new Gee Creek Watershed Coordinator. Staff kept partners informed of emerging developments in the National Fish Habitat Action Plan.</p>
--	---

13310-A-176 - [Determination of Bull Trout Instream Flow and Passage Needs in the Walla Walla River](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Monitoring of the Walla Walla bull trout spawning population continued to determine recovery. Better definition of bull trout distribution and habitat criteria helped to determine relevant areas for development of instream flow and passage needs. Additional PIT arrays were installed in the basin and some PIT arrays were improved to gather directional information and increase efficiency which should further refine distribution and movement information.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>This project is designed to provide the technical data to improve conditions for ESA-listed bull trout in the Walla Walla basin to make progress towards recovery and delisting.</p> <p>The problem:</p> <p>Inadequate instream flows occur throughout the basin, primarily as a result of irrigation withdrawals which may limit bull trout movement and distribution.</p> <p>The objective:</p> <p>Our objective continues to be an assessment of habitat and passage conditions in the basin to determine seasonal distribution and movement of bull trout throughout both un-impacted and impacted areas of the South Fork and mainstem river. This will allow development of instream flow targets for relevant areas in the basin.</p> <p>The method:</p>			
Expended	\$94069				
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.				
Primary Benefited Species	Bull trout (Salvelinus confluentus)				
Primary Benefited Population	Walla Walla River core area Bull Trout				
Plans	Bull Trout Draft Recovery Plan, Chapter 10				
Keyword	Monitoring and Assessment				
Need Number	N-002				
Partners	Oregon Department of Fish and Wildlife Umatilla Tribe Upper Columbia Fish and Wildlife Office Walla Walla Basin Watershed Council Washington Department of Fish and Wildlife				
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>2</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>7</td> </tr> </table>			Number of population assessments completed	2	Number of other Recovery Plan tasks implemented for T&E populations
Number of population assessments completed	2				
Number of other Recovery Plan tasks implemented for T&E populations	7				

Number of applied aquatic scientific and technologic tools shared with partners.	1	<p>Our work will determine the current distribution of bull trout and movement patterns to identify current passage and rearing areas. The Instream Flow Methodology can be applied to rearing and passage areas as habitat suitability curves are developed.</p> <p>Further description:</p> <p>PIT tag detection arrays were installed to determine passage timing and numbers for bull trout, steelhead, and spring Chinook. Fluvial bull trout passage was observed through late June, and sub-adult bull trout presence was documented at Nursery Bridge Dam during the summer. Snorkel surveys documented rearing bull trout in the mainstem downstream as far as the Washington/Oregon state line.</p>
--	---	--

13310-A-178 - [Determination of Bull Trout Instream Flow and Passage Needs in the Umatilla River Basin.](#)

Facility	Columbia River Fisheries Program Office
Expended	\$88389
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Umatilla River core area Bull Trout
Plans	Bull Trout Draft Recovery Plan, Chapter 10 Bull Trout Recovery Plan (Draft)
Keyword	Monitoring and Assessment
Need Number	N-002
Partners	Oregon Department of Fish and Wildlife Umatilla Tribe

Accomplishments

Number of population assessments completed	2
Number of other Recovery Plan tasks implemented for T&E populations	6

Accomplishment Summary

Work continued to assimilate physical and biological data. Spawning ground surveys were conducted, and surveys to determine juvenile and subadult distribution. Downstream movement of bull trout was detected during spring. Distribution of these fish will identify the area for instream flow targets.

Description

The importance to the Resource:

Bull trout are federally-listed as threatened. In the lower Umatilla River, there are a multitude of irrigation withdrawals that cause the river to be de-watered seasonally. Bull trout have been shown to utilize the lower river, and the lack of flow their potentially limits their production.

The problem:

Sections of the lower Umatilla River are de-watered seasonally making fish passage impossible and potentially limiting the production of bull trout, which have been shown to utilize the lower river. The de-watered sections result from extensive withdrawal of river water for irrigation.

The objective:

The objective is to determine when, seasonally, bull trout are impacted by the irrigation withdrawals, and to develop instream flow targets for the affected stream sections and time periods.

The method:

Snorkeling, radio tagging, and PIT-tagging in combination with remote PIT tag arrays will be

used to monitor the seasonal distribution and movement of migratory bull trout. This information will be used in modeling instream flow and setting flow targets for the impacted stream reaches.

Further description:

This project is designed to provide the technical data to improve conditions for ESA-listed bull trout in the Umatilla basin to make progress towards recovery and delisting. Inadequate instream flows occur throughout the basin, primarily as a result of irrigation withdrawals. Spawning ground surveys continued in the N. Fork Umatilla to maintain an index of bull trout population abundance and to quantify numbers of resident and fluvial spawners. Sampling during spring revealed a small downstream movement of subadult bull trout. These fish were either PIT-tagged to determine movement past remote detection arrays or radio tagged so they could be mobility tracked. The tagged fish remained in the upper Umatilla River, upstream from areas impacted by water diversions. Larger, older subadult bull trout rearing below the spring trapping site are currently being captured by snorkeling and dip-netting at night. They will also be radio-tagged and tracked throughout the year. Continued snorkeling, PIT tagging, and radio tagging will be used to track movements through fall, winter, and spring to determine usage and movement through the impacted lower section of the river.

13310-A-182 - [Determination of Bull Trout Instream Flow and Passage Needs in the John Day River Basin.](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Spawning ground surveys were conducted, and surveys to determine juvenile and subadult distribution which can be used when setting instream flow targets. Based on limited data, North Fork John Day bull trout historically moved large distances. Fluvial sized bull trout in the North Fork that were radio tagged and monitored during 2006 remained in the North Fork John Day. Their migration pattern may be limited due to insufficient water, warmer water temperatures and push-up dams.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>This project is designed to provide the technical data to improve conditions for ESA-listed bull trout in the John Day basin to make progress towards recovery and delisting.</p> <p>The problem:</p> <p>Inadequate instream flows occur throughout the basin, primarily as a result of irrigation withdrawals. Push up dams for irrigation diversions may limit passage.</p> <p>The objective:</p> <p>The objective is to determine when, seasonally, bull trout are impacted by the irrigation withdrawals, and to develop instream flow targets for the affected stream sections and time periods.</p> <p>The method:</p> <p>Snorkeling, radio tagging, and PIT-tagging will be used to monitor the seasonal distribution and movement of migratory bull trout. This</p>					
Expended	\$88389						
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.						
Primary Benefited Species	Bull trout (Salvelinus confluentus)						
Primary Benefited Population	John Day River core area Bull Trout						
Plans	Bull Trout Draft Recovery Plan, Chapter 9 Bull Trout Recovery Plan (Draft)						
Keyword	Monitoring and Assessment						
Need Number	N-002						
Partners	Oregon Department of Fish and Wildlife						
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of miles of in-stream habitat assessed</td> <td>12.0</td> </tr> <tr> <td>Number of population assessments completed</td> <td>1</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>4</td> </tr> </table>			Number of miles of in-stream habitat assessed	12.0	Number of population assessments completed	1	Number of other Recovery Plan tasks implemented for T&E populations
Number of miles of in-stream habitat assessed	12.0						
Number of population assessments completed	1						
Number of other Recovery Plan tasks implemented for T&E populations	4						

information will be used in modeling instream flow and setting flow targets for the impacted stream reaches.

Further description:

This project is designed to provide the technical data to improve conditions for ESA-listed bull trout in the John Day basin to make progress towards recovery and delisting. Inadequate instream flows occur throughout the basin, primarily as a result of irrigation withdrawals. Push up dams are prevalent for irrigation diversions in the mainstem John Day. Spawning ground surveys continued in the John Day to maintain an index of bull trout population abundance and to quantify numbers of resident and fluvial spawners. Continued snorkeling, PIT tagging, and radio tagging will be used to track movements through fall, winter, and spring to determine usage and movement through the impacted lower section of the river.

13310-A-185 - [Conservation Planning Activities](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Provided input, leadership and coordination to efforts for conserving lamprey, freshwater mussels, coastal cutthroat trout and Oregon chub.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>CRFPO staff participate in various conservation planning arenas, particularly on aquatic species in the Pacific Northwest that have traditionally not received adequate attention.</p> <p>The problem:</p> <p>Management planning occurs that involves many of the trust species for the USFWS, particularly lamprey, cutthroat trout, Oregon chub, and western pearlshell mussels. To be effective, these planning forums need technical expertise from the USFWS.</p> <p>The objective:</p> <p>Staff serve to coordinate the Lamprey Technical Work Group which is managed under the CBFWA, coordinate and participate with a Coastal Cutthroat Tehnical Workgroup, participate on a Freshwater Mussel Technical Work Group and participate in decisions on Oregon chub management and recovery..</p> <p>The method:</p> <p>The various management groups met regularly and provided guidance to regional managers on priority work, management activities, proposal review, and funding recommendations.</p>
Expended	\$43400	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Pacific lamprey (Lampetra tridentata)	
Primary Benefited Population	Not specified	
Plans	<p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>Coastal Cutthroat Trout Framing Document (draft)</p> <p>Columbia River Basin Fish and Wildlife Program (NPPC 2000)</p> <p>Recovery Plan for the Oregon Chub (<i>Oregonichthys crameri</i>)</p>	
Keyword	Interjurisdictional	
Need Number	N-002	
Partners	<p>Alaska Department of Fish and Game</p> <p>Bonneville Power Administration</p> <p>Columbia River Basin Tribes</p> <p>Columbia River Inter Tribal Fish Commission</p> <p>Confederated Tribes of</p>	

The Warm Springs
 Idaho Department of
 Fish and Game
 Oregon Department of
 Fish and Wildlife
 Oregon State
 University
 U.S. Geological Survey
 Umatilla Tribe
 Washington
 Department of Fish and
 Wildlife

Further description:

The lamprey group reviewed proposals for work on lamprey (e.g. AFEP proposals to COE and proposals to FWS and BPA). As coordinator of the group, CRFPO also acted as a liaison to other lamprey groups in the region. CRFPO staff provided technical guidance to the development of a lamprey conservation strategy being pursued by the Region (1) Office. Finally, CRFPO staff were (and are) one of the lead entities involved in the development of a coastal cutthroat symposium, monitoring framework design, and conservation plan.

Accomplishments

Number of population assessments completed	6
Number of other Recovery Plan tasks implemented for T&E populations	3
Number of other Fishery Management Plan tasks implemented for populations of management concern.	2
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	2

13310-A-197 - [Ecological Interactions between Hatchery and Wild Fish in Eagle Creek, Oregon](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Study design and work plans have been developed with Eagle Creek NFH, Abernathy FTC, and the LCR Fish Health Center. In-stream assessments on wild fish populations and hatchery studies have been initiated for hatchery reform.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Information gathered from these projects will be used in management decisions at National Fish Hatcheries to minimize the risk to wild and listed fish and lead to hatchery reform.</p> <p>The problem:</p> <p>Hatchery fish can have negative impact to wild and ESA listed fish. Hatcheries built to mitigate loss of fisheries from habitat destruction and dams are now taking on a role to help conserve populations.</p> <p>The objective:</p> <p>CRFPO staff worked closely with our Fish Health Center, Abernathy FTC, Eagle Creek National Fish Hatchery (ECNFH), NOAA Fisheries, and Oregon Department of Fish and Wildlife in developing and implementing plans to investigate ecological interactions between hatchery salmon and steelhead from ECNFH and native fishes in Eagle Creek, Oregon.</p> <p>The method:</p> <p>Developing in-stream evaluations and monitoring techniques to estimate distribution, abundance, run timing, and behavioral interaction between hatchery and wild fish. Adult salmon and steelhead were affixed with</p>
Expended	\$169220	
Objective	Develop and share applied aquatic scientific and technologic tools with partners.	
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)	
Primary Benefited Population	Clackamas River winter run steelhead	
Plans	<p>1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin.</p> <p>Eagle Creek NFH Coho Salmon Hatchery and Genetic Management Plan</p> <p>Eagle Creek NFH Winter Steelhead Hatchery and Genetic Management Plan</p> <p>2000 NMFS FCRPS Biological Opinion - December 21, 2000</p>	
Keyword	Fish Technology	
Need Number	N-002	
Partners	<p>Abernathy Fish Technology Center</p> <p>Bureau of Land Management</p> <p>Eagle Creek National Fish Hatchery</p> <p>Lower Columbia River Fish Health Center</p> <p>National Oceanic and Atmospheric Administration,</p>	

	Fisheries Oregon Department of Fish and Wildlife Portland General Electric U. S. Forest Service	<p>radio-tags and genetic samples collected in order to compare the distribution, behavior, and their reproductive success.</p> <p>Further description:</p> <p>Hatchery fish have been marked and coded-wire tagged, multiple rearing densities of hatchery steelhead are being evaluated, and we have monitored releases of these juvenile salmon using radio telemetry.</p>
<p>Accomplishments</p>		
Number of population assessments completed	6	
Number of other Recovery Plan tasks implemented for T&E populations	5	
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	2	

13310-A-198 - [Fisheries Restoration and Irrigation Mitigation Act \(FRIMA\)](#)

Facility	Columbia River Fisheries Program Office
Expended	\$0
Objective	Develop and improve long-term partnerships with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for aquatic resources.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Not specified
Plans	Fisheries Restoration and Irrigation Mitigation Act of 2000 (PL 106-502)
Keyword	Fish Passage
Need Number	N-002
Partners	Oregon Department of Fish and Wildlife (\$363739) Oregon Water Trust

Accomplishments

Fish passage barriers removed or bypassed	1
Number of other Fishery Management Plan tasks implemented for populations of management concern.	2

Accomplishment Summary

Ranked projects competing for screens funding and, once selected, helped assure that all projects have completed the necessary environmental compliance procedures.

Description

The importance to the Resource:

Improperly screened or unscreened diversions may directly kill fish or indirectly kill fish through intrainment into irrigation works. In some cases, these fish are listed under the ESA, and mortality at diversions can impede recovery.

The problem:

Irrigation diversions throughout the Pacific Northwest may be unscreened or not screened to appropriate criteria. This may lead to direct fish mortality or indirect through intrainment into canal/irrigation works. Diversion structures may be impassable and restrict or inhibit habitat use by fish.

The objective:

The objective is to modify diversions to allow passage and screen diversions to prevent intrainment of adult and juvenile fish into irrigation works.

The method:

Projects install new screens and passage facilities at existing sites to bring them into compliance with Oregon guidelines.

Further description:

The Columbia River Fisheries Program Office assists FRIMA implementation by serving as

	<p>the coordinator for projects in Oregon. This entails working with the Oregon Department of Fish and Wildlife, and other cooperators to rank projects competing for funding and, once selected, assuring that all projects have completed the necessary environmental compliance procedures. The focus of FRIMA is to provide funding to construct and install screening and passage facilities at water diversion sites.</p>
--	---

13310-A-203 - [Cross Program Recovery](#)

Facility	Columbia River Fisheries Program Office	Accomplishment Summary CRFPO staff provided technical expertise in CPR forums, specifically relative to coastal cutthroat trout and Oregon chub
Expended	\$10000	
Objective	Develop and improve long-term partnerships with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for aquatic resources.	
Primary Benefited Species	Oregon chub (Oregonichthys crameri)	
Primary Benefited Population	Not specified	
Plans	<p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>Coastal Cutthroat Trout Framing Document (draft)</p> <p>MEMORANDUM OF UNDERSTANDING between OREGON FISH AND WILDLIFE OFFICE, U.S. FISH AND WILDLIFE SERVICE and OREGON DEPARTMENT OF FISH AND WILDLIFE</p> <p>Endangered and Threatened Wildlife and Plants; Withdrawal of Proposed Rule To List the Southwestern Washington/Columbia River Distinct Population Segment of the Coastal Cutthroat Trout as Threatened50 CFR Part 17</p> <p>Oregon Conservation Strategy</p>	Description
		The importance to the Resource:
		The Cross Program Recovery program initiated in Region 1 was designed to foster cooperative efforts between Fisheries, ES and NWR to implement beneficial actions for imperiled species in the Region.
		The problem:
		Previous Service efforts targeting restoration of Oregon chub and coastal cutthroat trout were attempted along programmatic lines without the full benefit of a cross program approach.
		The objective:
		The objective is to collaborate across program lines and combine the expertise within each program to solicit funding to delist Oregon chub and keep coastal cutthroat trout off the Endangered Species list.
		Further description:
		Columbia River Fisheries Program Office staff play a key role in the Cross Program Recovery efforts. Relative to fish species, to date, CPR efforts have been focused on Oregon chub and coastal cutthroat trout. CRFPO staff have provided technical expertise in these forums. In particular, an assessment of research priorities for Oregon chub was conducted. As a result of this exercise, CRFPO facilitated cooperative research on Oregon chub population genetics. Furthermore, CRFPO staff have worked with

	Recovery Plan for the Oregon Chub (<i>Oregonichthys crameri</i>)	<p>various NWR to evaluate research needs relative to coastal cutthroat trout. Working with staff from Ecological Service's the CRFPO hosted a Coastal Cutthroat Trout Symposium to update the status of the species. As an outcome of this event, the States of Washington, Oregon, Alaska, as well as British Columbia have agreed to pursue a range-wide conservation initiative.</p>
Keyword	Recovery	
Need Number	N-002	
Partners	Alaska Department of Fish and Game Oregon Department of Fish and Wildlife U.S. Geological Survey Washington Department of Fish and Wildlife	
Accomplishments		
Number of population assessments completed		2

13310-A-206 - [Restoration of Aquatic Habitat and Monitoring on Refuges](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Developed proposals to address aquatic habitat and monitoring needs at National Wildlife Refuges that were identified at the NWR-CRFPO workshop; Provided technical assistance on various planning, habitat, and monitoring issues; Conducted surveys of fish and aquatic habitats; Coordinated with partners in developing approaches to conduct and monitor habitat restoration projects at refuges, Participated in cross-program and partnership activities affecting refuges.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>National Wildlife Refuges and associated watersheds provide opportunities to manage and restore fishery, habitat, and other aquatic resources. Such opportunities may contribute to recovering listed species, reversing population declines, and protecting habitats. Monitoring effects of restoration activities is essential for informed management.</p> <p>The problem:</p> <p>Opportunities for fish and aquatic habitat restoration, as well as adequate monitoring and assessment of restoration actions, at National Wildlife Refuges are diminished due to lack of specific information concerning aquatic resources and access to personnel with fisheries expertise.</p> <p>The objective:</p> <p>The objective is to provide National Wildlife Refuges with fisheries assistance concerning aquatic resource issues such as habitat restoration projects and approaches to monitor and assess fish and aquatic habitats, which will</p>					
Expended	\$80743						
Objective	Increase the quantity and improve the quality of aquatic and riparian habitat on Service lands.						
Primary Benefited Species	(0) Multiple Species						
Primary Benefited Population	Not specified						
Plans	Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper) National Wildlife Refuge System Improvement Act of 1997						
Keyword	Service Lands						
Need Number	N-002						
Partners	National Wildlife Refuges and friends groups						
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>28</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> <tr> <td>Number of other Fishery Management Plan tasks implemented for populations of</td> <td>3</td> </tr> </table>			Number of population assessments completed	28	Number of other Recovery Plan tasks implemented for T&E populations	1	Number of other Fishery Management Plan tasks implemented for populations of
Number of population assessments completed	28						
Number of other Recovery Plan tasks implemented for T&E populations	1						
Number of other Fishery Management Plan tasks implemented for populations of	3						

<p>Number of other Fishery Management Plan tasks implemented for populations of management concern.</p>	<p>3</p>	<p>contribute management decisions and refuge planning.</p>
		<p>The method:</p>
		<p>The CRFPO provided refuges with fisheries staff time and resources to assist refuge managers in a variety of ways such as attending coordination and technical work meetings, conducting fish and habitat assessments, and developing plans and proposals to implement and monitor restoration actions.</p>
		<p>Further description:</p>
		<p>The Columbia River Fisheries Program Office and National Wildlife Refuges (i.e., those within the geographic area of responsibility of the CRFPO--Columbia River basin below McNary Dam, Oregon waters excluding the Klamath River basin, small tributaries of Willapa NWR) held a workshop to discuss aquatic resource issues and needs at refuges. Several needs were identified that the CRFPO could provide assistance to refuges, including fisheries assistance concerning habitat restoration and monitoring. Examples of assistance that the CRFPO provided to refuges to address needs during FY06 include: Conducting surveys in various habitats at Steigerwald Lake NWR to determine fish species composition; Providing equipment and assistance to personnel at Tualatin NWR to conduct surveys required by a biological opinion for a wetland restoration project; Coordinating among partners to develop proposals for assessing tidal marsh restoration projects at two Oregon Coast refuges for which funding was secured for one NWR from the National Fish and Wildlife Federation, and providing comments concerning aquatic habitats and resources for developing Comprehensive Conservation Plans at three NWRs.</p>

13310-A-207 - [Aquatic Monitoring on Lower Columbia River Islands](#)

Facility	Columbia River Fisheries Program Office
Expended	\$0
Objective	Increase the quantity and improve the quality of aquatic and riparian habitat on Service lands.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Not specified
Plans	Biological and Conference Opinions for the Columbia River Channel Improvements Project National Wildlife Refuge System Improvement Act of 1997
Keyword	Monitoring and Assessment
Need Number	N-002
Partners	Julia Butler Hansen National Wildlife Refuge Lewis and Clark National Wildlife Refuge U.S. Army Corps of Engineers (\$147224)

Accomplishments

Number of habitat assessments completed	1.0
Number of population assessments completed	4
Number of other Recovery Plan tasks	1

Accomplishment Summary

Conducted fish and habitat surveys at two islands on National Wildlife Refuges to collect baseline information for proposed modification of tidegates intended to improve habitat for juvenile salmonids

Description

The importance to the Resource:

Slough habitats function as important rearing areas for juvenile anadromous fish and provide sources of invertebrate production and organic matter that is transported to the lower Columbia River.

The problem:

Levees and tidegates were constructed at Julia Butler Hansen NWR during the early-to-mid 1900s, and have restricted fish access to slough and former tidal marsh habitats. Although the refuge is managed primarily for Columbian white-tailed deer, improvements to fish access to aquatic habitats can be made that are compatible with current management.

The objective:

Objective of the project is to assess habitat variables and fish use relative to tidegate operation at Julia Butler Hansen and reference sites at Lewis and Clark NWR. This information will be used to evaluate the effects of tidegate modifications and potential increase access of juvenile fish to rearing habitat.

The method:

The project will use an approach that compares physical and biological variables between conditions existing both pre- and post-

implemented for T&E populations		<p>construction of modified tidegates and additional points of access, as well as comparisons with conditions at appropriate reference sites at the refuge not affected by levees and tidegates.</p> <p>Further description:</p> <p>The Army Corps of Engineers has proposed a restoration project at Tenasillahe Island, located at Julia Butler Hanson NWR, intended to benefit juvenile salmonids. If hydraulic analyses indicate that habitat for listed Columbia white-tailed deer will not be negatively affected, activities of the interim phase include modifications to tidegates and construction of controlled water inlets to improve water exchange and juvenile salmonid passage between island sloughs and the Columbia River. Possible long-term activities include breaching dikes on the island to restore tidal circulation, which are contingent upon delisting of the deer and a positive compatibility determination with refuge purposes. The CRFPO conducted preliminary surveys to describe habitat and fish presence and distribution in sloughs on Tenasillahe Island and at an adjacent island lacking dikes and tidegates. These data will contribute to establishing a baseline to which data collected after construction will be compared to evaluate the effects of restoration activities.</p>
Number of other Fishery Management Plan tasks implemented for populations of management concern.	2	

13310-A-208 - [Monitoring the Use of the Mainstem Columbia River by Bull Trout from the Walla Walla River Subbasin](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>A remote PIT tag detection array was operated in the lower Walla Walla River to monitor the passage of bull trout between the Walla Walla and Columbia Rivers. An incidental advantage of the installation is the detection of Chinook and steelhead to benefit state and tribal fisheries programs.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Bull trout historically used the mainstem Columbia and Snake rivers as part of their life cycle and they are currently listed as a threatened species.</p> <p>The problem:</p> <p>Passage in the lower Walla Walla and the presence of hydropower dams in the Columbia may be restricting bull trout movement and limiting progress towards recovery.</p> <p>The objective:</p> <p>This project is designed to help determine use of mainstem Columbia River habitat by bull trout, consistent with the USFWS 2000 FCRPS Biological Opinion.</p> <p>The method:</p> <p>A multi-agency effort by the USFWS, Forest Service, and Utah State University has tagged more than 2,000 bull trout with PIT tags in the basin. The installation of the PIT array at Oasis Road Bridge will monitor movement of PIT tagged bull trout between the Walla Walla and Columbia Rivers.</p>
Expended	\$0	
Objective	Utilize appropriate scientific and technologic tools in formulating and executing fishery management plans and policies.	
Primary Benefited Species	Bull trout (Salvelinus confluentus)	
Primary Benefited Population	Walla Walla River core area Bull Trout	
Plans	2000 FWS Biological Opinion - Effects to Listed Species from Operations of the Federal Columbia River Power System Bull Trout Draft Recovery Plan, Chapter 10	
Keyword	Monitoring and Assessment	
Need Number	N-002	
Partners	U.S. Army Corps of Engineers (\$86031) Umatilla Tribe Walla Walla Basin Watershed Council Washington Department of Fish and Wildlife	
Accomplishments		

Number of other Recovery Plan tasks implemented for T&E populations	4	Further description: This detection site will also continue to provide data on Chinook and steelhead that are important to state and tribal fisheries management programs.
---	---	--

13310-A-209 - [Develop Geographic Information System Program for staff & provide analytical support and training.](#)

Facility	Columbia River Fisheries Program Office
Expended	\$110000
Objective	Utilize appropriate scientific and technologic tools in formulating and executing fishery management plans and policies.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Not specified
Plans	Columbia River Basin Fish and Wildlife Program (NPPC 2000) Bull Trout Draft Recovery Plan, Chapter 10 Bull Trout Recovery Plan (Draft)
Keyword	Monitoring and Assessment
Need Number	N-002
Partners	

Accomplishments

Number of habitat assessments completed	2.0
Number of miles of in-stream habitat assessed	59.0
Number of other Recovery Plan tasks implemented for T&E populations	5
Number of other Fishery Management	2

Accomplishment Summary

Acquired GIS analyst who planned, developed, and is implementing our GIS program and capabilities to assess aquatic habitat for resident and anadromous fish in the Columbia River basin. Training was provided to staff on using software for analysis and display. GIS layers were developed for hydrologic modeling and a fall Chinook spawning habitat assessment in the Hanford Reach of the Columbia R. GIS layers were developed for a bull trout spawning habitat assessment and multi-basin patch analysis.

Description

The importance to the Resource:

GIS analysis has become critical for resource assessments due to the ability to perform complex spatial and statistical analyses. Spatial problem solving produces more realistic, understandable solutions since most problems are spatially oriented. Adequate GIS capabilities are critical for recovery planning and developing conservation strategies.

The problem:

Complex spatial and statistical analyses and queries are not possible without a fully functioning GIS program. Analytical products are difficult to understand in numeric and text formats. Easy to understand maps that depict results of analyses are not available. Recovery planning is more difficult and less intuitive without GIS capabilities.

The objective:

The objective of the project is to obtain a GIS analyst (FTE) and the necessary hardware,

Plan tasks implemented for populations of management concern.		<p>software, and field equipment to work towards implementation of an enterprise GIS program along with the ability to conduct spatially oriented field work that will be compatible with, and benefit from analytical and display capabilities of the program.</p> <p>The method:</p> <p>A GIS analyst with the necessary skills will develop and implement the program and provide analytical assistance and training. Hardware (e.g. servers, plotters) and software (e.g. ARCGis) will be acquired that will enable GIS assessments and analyses. Field equipment (e.g. GPS) will be acquired that will enable spatially oriented data collection.</p> <p>Further description:</p> <p>Advanced GIS analysis has become a requirement for many CRFPO resource assessment activities due to the ability to perform complex spatial and statistical analyses that were not previously feasible. Spatial problem solving produces more realistic on-the-ground solutions since most problems are spatially distributed. Our GIS capabilities will be better able to adequately provide technical support for recovery plans and multi-state conservation strategies such as those for bull trout, cutthroat trout, and Pacific lamprey. Hardware, software, and field equipment need to be acquired to complete development of our comprehensive, integrated GIS program. Because of the diverse nature of the CRFPO and the strong spatial orientation of its work, a functional GIS with appropriate equipment will provide essential information for many products currently required by the agency. Developed GIS layers for building a hydrologic model in the Hanford Reach of the Columbia River. Developed GIS layers for assessing spawning habitat suitability of fall chinook salmon in the Hanford Reach. Developed GIS</p>
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	1	

	layers for assessing spawning habitat suitability of bull trout in the South Fork of the Walla Walla River, Oregon
--	--

13310-A-210 - [NE Oregon Bull Trout Population Structure and Dynamics](#)

Facility	Columbia River Fisheries Program Office
Expended	\$67739
Objective	Utilize appropriate scientific and technologic tools in formulating and executing fishery management plans and policies.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Not specified
Plans	Bull Trout Recovery Plan (Draft) Bull Trout Draft Recovery Plan, Chapter 12
Keyword	Monitoring and Assessment
Need Number	N-002
Partners	Oregon Department of Fish and Wildlife U. S. Forest Service

Accomplishments

Number of population assessments completed	6
Number of other Recovery Plan tasks implemented for T&E populations	10

Accomplishment Summary

The ultimate goal of this project is to provide empirical information toward defining minimum viable populations of bull trout. A PIT tag antenna was installed to help confirm isolation of study populations. PIT tags were implanted in bull trout throughout the study area. A bull trout abundance estimate of the isolated portion of Big Sheep Creek was conducted to provide demographic information that will be compared to the genetic effective population size determined from sampled genetic tissues.

Description

The importance to the Resource:

Recovery of bull trout will depend, in part, on understanding the numbers of bull trout that a population must contain to be viable. The ultimate goal of this study is to provide empirical information toward defining minimum viable populations of bull trout.

The problem:

The Imnaha River subbasin provides a unique opportunity to provide information toward bull trout recovery. The drainage includes an irrigation canal which effectively isolated small populations of bull trout that continue to persist. Empirical information on the effective population size of these populations will contribute toward recovery.

The objective:

The objectives of this study are to describe connectivity among populations, determine within and among population genetic structure, estimate bull trout abundance, and determine effective population size through demographic and genetic methods.

	<p>The <i>method</i>:</p> <p>The objectives will be accomplished through a combination of technology (PIT tags), genetic analysis, and sampling methodology.</p>
--	---

13310-A-216 - [Deep Creek Fish Passage Project](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Work done this FY was getting the coop agreement together and signed, and funding to the project proponent. Actual construction work is slated for 2007. Environmental compliance was done by the Oregon FWO Partners Program Staff, who also contributed funding for the bypass.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>This project provides the fish bypass for the new screen/passage system installed on Deep Creek, in the Warner Basin, Oregon. Deep Creek is one of three main tributaries to the Warner Lakes system. Fish species benefited include the Warner sucker (threatened) and Warner Basin redband trout.</p> <p>The problem:</p> <p>The O'Keefe diversion is unscreened, allowing fish to be entrained into the irrigation system.</p> <p>The objective:</p> <p>The objective of the project is to provide the bypass system to the new screening and passage facilities built with FRIMA funding.</p> <p>The method:</p> <p>The bypass is approximately 200 feet long, and will include drop wells, designed and implemented by the Oregon Department of Fish and Wildlife screen shop.</p> <p>Further description:</p> <p>Correcting this diversion will restore passage to approximately 2.5 miles of habitat.</p>			
Expended	\$25000				
Objective	Maintain diverse, self-sustaining fish and other aquatic resource populations.				
Primary Benefited Species	Warner sucker (Catostomus warnerensis)				
Primary Benefited Population	Warner Valley				
Plans	Oregon Conservation Strategy				
Keyword	Fish Passage				
Need Number	N-002				
Partners	<p>FRIMA (for other project purposes) (\$27657)</p> <p>Lakeview Soil and Water Conservation District (\$2000)</p> <p>Local Landowner(s) (\$10010)</p> <p>Oregon Department of Fish and Wildlife (\$72900)</p> <p>Partners For Fish and Wildlife (\$5000)</p> <p>Warner Basin Watershed Council (\$2000)</p>				
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of miles re-opened to fish passage</td> <td>2.5</td> </tr> <tr> <td>Number of population assessments completed</td> <td>3</td> </tr> </table>			Number of miles re-opened to fish passage	2.5	Number of population assessments completed
Number of miles re-opened to fish passage	2.5				
Number of population assessments completed	3				

13310-A-217 - [South Fork John Day/John Day Watershed Fish Passage Projects](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Four projects are addressed this season, opening 23 miles of habitat to year round access and removing nine barriers</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The John Day River is the 2nd longest free flowing river system in the U.S., running nearly 300 miles. Upper river projects benefit several species: bull trout, Mid_Columbia River steelhead, resident interior redband, and westslope cutthroat trout. Bull trout and steelhead are listed as threatened.</p> <p>The problem:</p> <p>Numerous small push-up dams are constructed along the river seasonally, as well as numerous fixed diversion points on the mainstem and tributaries. These may block access as well as intrain fish into irrigation systems if unscreened or improperly screened.</p> <p>The objective:</p> <p>The objective is to restore passage and prevent intrainment into irrigation systems.</p> <p>The method:</p> <p>Several methods may be applied, replacing diversions with pumps, lay-flat stanchion structures that provide passage for all life stages, and consolidating several diversion points into a single diversion with passage and screening facilities.</p> <p>Further description:</p> <p>The first stage of this project addresses Lower</p>
Expended	\$45000	
Objective	Develop and improve long-term partnerships with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for aquatic resources.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	John Day River upper mainstem Spring Chinook	
Plans	Oregon Conservation Strategy The Oregon Plan for Salmon and Watersheds	
Keyword	Fish Passage	
Need Number	N-002	
Partners	Grant County Soil and Water Conservation District, Oregon (\$314211) Oregon Water Trust (\$5000) Oregon Watershed Enhancement Board (\$27736)	
Accomplishments		
Number of miles re-opened to fish passage	23.0	

Fish passage barriers removed or bypassed	9	South Fork John Day, Roberts Creek, Lawrence Diversion, and South Reynolds Creek.
Number of population assessments completed	3	
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1	

13310-A-218 - [Elk Creek Nehalem River fish Passage Project](#)

Facility	Columbia River Fisheries Program Office
Expended	\$15000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Coho salmon or silver salmon (Oncorhynchus kisutch)
Primary Benefited Population	Lower Columbia River ESU (Threatened)
Plans	Oregon Conservation Strategy
Keyword	Fish Passage
Need Number	N-002
Partners	Columbia County, Oregon (\$2500) Oregon Department of Fish and Wildlife (\$2400) Oregon Watershed Enhancement Board (\$10194)

Accomplishments

Number of miles re-opened to fish passage	3.6
Number of population assessments completed	3

Accomplishment Summary

Upon completion of this project we will eliminate fish passage barrier associated with undersized culverts on Elk Creek at two crossings. Final designs will allow removal of the culvert and replacement with an appropriately sized bridge or culvert. Correcting this barrier will restore access to 3.6 miles of stream. Initial funding in year one will be used to design the project. Subsequent funding will be used to implement the design and restore full passage conditions

Description

The importance to the Resource:

Elk Creek is a key tributary within the watershed with high intrinsic value for Coho production. Fish species verified as using this creek include coho, sea-run and residential coastal cutthroat trout, and brook lamprey. This system contains a large percentage of low gradient habitat, suggesting high potential for coho habitat use.

The problem:

Improperly sized culverts impede passage at two crossings on Elk Creek. The current condition impedes adult passage, conditional upon depth and velocity of flow, and a year round juvenile passage barrier.

The objective:

The objective of the project is to remove the undersized culverts and replace them with an appropriately sized bridge or culvert to restore full passage.

The method:

	<p>Culvert replacement with a bridge or appropriately sized culvert.</p> <p>Further description:</p> <p>This is a cross program project in conjunction with ecological services and State and local partners. Upon completion of this project we will eliminate fish passage barrier associated with undersized culverts on Elk Creek at two crossings. Final designs will allow removal of the culvert and replacement with an appropriately sized bridge or culvert. Correcting this barrier will restore access to 3.6 miles of stream. Initial funding in year one will be used to design the project. Subsequent funding will be used to implement the design and restore full passage conditions</p>
--	---

13310-A-220 - [Population Assessment in the White Salmon River](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Provided assistance to partners and helped secure their funding to meet joint monitoring and collection goals for Service and U.S. Forest Service needs in the White Salmon River prior to removal of Condit Dam (Fall 2008). Performed abbreviated snorkel surveys and coordinated the collection of fin clips by U.S. Geological Survey. Acted as a data liaison between agencies and organized data for submission. Wrote a summary report and provided to funding source.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Little information exists on the production and presence of juvenile Chinook salmon, coho salmon, and <i>Oncorhynchus mykiss</i> (rainbow trout/steelhead) in the White Salmon River. Returning hatchery adults may produce some juveniles but little information is known. Outmigration, size of fish, and outmigration period is also unknown.</p> <p>The problem:</p> <p>No monitoring of naturally produced salmon and steelhead occurs in the White Salmon River. Condit Dam, located 2.3 miles upstream from it's confluence with the Columbia River will be removed in fall 2008. The number, presence, and biological information of current species must gathered for future restoration after removal of the dam.</p> <p>The objective:</p> <p>The project objectives were to collect genetic clips on juvenile salmon and steelhead present in the White Salmon River during spring outmigration and to document the presence of</p>
Expended	\$0	
Objective	Develop and improve long-term partnerships with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for aquatic resources.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	White Salmon River fall run (tule Chinook)	
Plans	<p>White Salmon Subbasin Plan</p> <p>1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin.</p> <p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p>	
Keyword	Monitoring and Assessment	
Need Number	N-002	
Partners	<p>U. S. Forest Service (\$2675)</p> <p>U.S. Geological Survey</p>	
Accomplishments		

Number of population assessments completed	2
Recovery Plan production tasks implemented (PART)	1
Number of other Recovery Plan tasks implemented for T&E populations	3
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1

these species in the lower White Salmon River. Archival of these genetic samples allows future analysis and aids in fish restoration efforts after dam removal.

The method:

Partnering, assisting, and aiding USGS to fund a rotary screw trap in the lower White Salmon River allowed for collection of juvenile salmon and steelhead fin clips. Bi-monthly snorkel surveys were conducted trap operation in an effort to gather corresponding data for the presence, absence, and number of fish species in the lower river.

Further description:

This assessment is part of a larger group effort by Washington Department of Fish and Wildlife, the Yakama Indian Nation, Underwood Conservation District, U.S. Forest Service, and the U.S. Geological Survey to gather information on the White Salmon River before removal of Condit Dam in fall 2008. Each partner is working towards goals benefiting their interest but also assisting in the collection of information important to the restoration of the White Salmon. Although funding of the project was low, it allowed Service staff to aid in the funding request of USGS to operate a rotary screw trap, and met the goals of the funding source, the U.S. Forest Service by collecting genetic clips from outmigrating juvenile salmon and steelhead. By working with USGS as a partner, more information was gathered and better data collection occurred than the Service staff could have accomplished alone with the funding provided.

13310-A-221 - [Tryon Creek Monitoring](#)

Facility	Columbia River Fisheries Program Office	<p>Accomplishment Summary</p> <p>Conducted pre-restoration monitoring of lamprey species on Tryon Creek. Lamprey are one of several species being monitored (Coho, Steelhead, Cutthroat trout).</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Steelhead (Lower Willamette River ESU-threatened), coho (Lower Columbia River ESU-threatened), resident rainbow and cutthroat trout and lamprey historically spawned and reared in Tryon Creek. Habitat is still suitable for spawning/rearing anadromous fish but the Highway 43 culvert has probably impeded passage since its construction 50 years ago.</p> <p>The problem:</p> <p>Although fish habitat appears to exist in upstream areas, a 400 foot culvert near the mouth of the creek inhibits fish passage, particularly upstream. ODOT is conducting a culvert retrofit to improve fish passage. Pre- and post-restoration monitoring of salmonid and lamprey species is necessary to assess the retrofit.</p> <p>The objective:</p> <p>CRFPO has partnered with several federal, state and local agencies to monitor salmonid and lamprey species in Tryon Creek Natural Area. Monitoring before and after the proposed culvert retrofit is necessary to assess the restoration effort.</p> <p>The method:</p> <p>Tryon Creek was electroshocked to determine presence of juvenile Pacific and juvenile and</p>
Expended	\$2000	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Pacific lamprey (Lampetra tridentata)	
Primary Benefited Population	Columbia River Pacific Lamprey	
Plans	<p>Columbia River Basin Fish and Wildlife Program (NPPC 2000)</p> <p>Lower Columbia and Columbia Estuary Bi-State Subbasin Plan - 2004</p> <p>Critical Uncertainties for Lamprey in the Columbia River Basin: Results from a strategic planning retreat of the Columbia River Lamprey Technical Workgroup 2005</p>	
Keyword	Recovery	
Need Number	N-002	
Partners	<p>City of Lake Oswego (\$20000)</p> <p>City of Portland</p> <p>Friends of Tryon Creek</p> <p>National Marine Fisheries Service</p> <p>National Oceanic and Atmospheric Administration, Fisheries</p> <p>Oregon Department of</p>	

Fish and Wildlife
 Oregon Department of
 Transportation (\$60000)
 Tryon Creek Watershed
 Council

Accomplishments

Number of Friends Groups	1
Number of miles of in-stream habitat assessed	7.0
Number of population assessments completed	4
Number of other Fishery Management Plan tasks implemented for populations of management concern.	9

adult Western brook lamprey. This was the first effort in a large scale project involving pre- and post restoration monitoring of lamprey and salmonid species.

Further description:

Tryon Creek is one of the largest, relatively protected, urban watersheds in Oregon. Pacific lamprey numbers have declined to a remnant of those for historical populations. Pacific lamprey are limited by many of the same factors and threats as salmon, particularly habitat (including passage) and ecological interactions. Preliminary survey data shows that all species of anadromous fish are underrepresented in Tryon Creek upstream of the culvert. While resident fish seem to be the primary inhabitants upstream of the culvert, habitat surveys have suggested that there is suitable habitat both downstream and upstream of the culvert for spawning and rearing of anadromous fish. The culvert in Tryon Creek has likely been impeding fish passage for more than 50 years. Overall, there is a conservation need to improve fish passage conditions in Tryon Creek. The short-term conservation need for the proposed project is to assess the current status of anadromous fish species in Tryon Creek before changing fish passage conditions. The long-term restoration needs of the proposed project are to determine if anadromous fish passage is improved by culvert modification as well as if status improves above the culvert after modification.

14226-A-111 - [Health Monitoring Kootenai River White Sturgeon for use in Restoration](#)

Facility	Idaho Fish Health Center	<p>Accomplishment Summary</p> <p>The IFHC enabled the successful spawning of healthy fish and the release of healthy family groups to assist in endangered Kootenai River white sturgeon recovery efforts.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>In 2006 work conducted at the Idaho Fish Health enabled the successful spawning of healthy fish and the release of healthy family groups from brood year 2005 fish to assist in the recovery and restoration of this endangered species.</p> <p>The problem:</p> <p>No recruitment has occurred for several years in the Kootenai River White Sturgeon populations. Erection of numerous dams, especially Libby Dam, have prevented fish migration and release of water flows needed for spawning.</p> <p>The objective:</p> <p>The KTOI captures wild fish and spawns them, transferring and rearing the larvae and young fish in their hatchery. These fish are raised for a year, and then released into the wild in hopes of establishing a self-sustaining population</p> <p>The method:</p> <p>We performed all fish health services required for the successful rearing, release, and transfer of endangered Kootenai River White Sturgeon in cooperation with the Kootenai Tribe of Idaho. Water conditions made it imperative that two rearing sites be available, to reduce the risk of disease transmission.</p>	
Expended	\$6000		
Objective	Develop and improve long-term partnerships with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for aquatic resources.		
Primary Benefited Species	White sturgeon (Acipenser transmontanus)		
Primary Benefited Population	Not specified		
Plans	<p>2000 FWS Biological Opinion - Effects to Listed Species from Operations of the Federal Columbia River Power System</p> <p>Kootenai River White Sturgeon Recovery Plan</p> <p>The Service's Native American Policy</p>		
Keyword	Fish Health		
Need Number	N-002		
Partners	Kootenai Tribe of Idaho		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>2</td> </tr> </table>			Number of population assessments completed
Number of population assessments completed	2		

	<p>Further description:</p> <p>Half of the broodstock is reared in Canada which requires numerous permits, testing regimes to verify fish health. With the drainage extending into Canada, releasing juvenile white sturgeon into the Kootenai River also requires extensive health monitoring.</p>
--	--

14330-A-003 - [Increasing the Survival of Juvenile Fall Chinook Salmon in the Snake River.](#)

Facility	Idaho Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We provided in-season data to help time releases of reservoir water and then verified that these releases increased survival of fall Chinook salmon passing downstream in the FCRPS.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>This project will help to recover of Snake River fall Chinook salmon listed as threatened under the ESA. It was identified as research activity 190 in the 2000 Federal Columbia River Power System (FCRPS) Biological Opinion.</p> <p>The problem:</p> <p>The migrational corridor of juvenile Snake River fall Chinook salmon was impounded by eight hydroelectric dams comprising the FCRPS. To increase passage survival, cool water is released from reservoirs located upstream to increase velocity and decrease temperature during the summer. Analyses were needed to evaluate passage survival.</p> <p>The objective:</p> <p>The objective of this project is to determine if releasing cool water from reservoirs located upstream of the FCRPS increases survival of Snake River fall Chinook salmon juveniles passing downstream in the FCRPS.</p> <p>The method:</p> <p>We are using passive integrated transponder tags (PIT tags) to monitor downstream passage survival of wild fall Chinook salmon juveniles in the FCRPS.</p>					
Expended	\$166000						
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.						
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)						
Primary Benefited Population	Snake River Fall Chinook Salmon						
Plans	2000 NMFS FCRPS Biological Opinion - December 21, 2000						
Keyword	Recovery						
Need Number	N-002						
Partners	Bonneville Power Administration U.S. Geological Survey Washington Department of Fish and Wildlife						
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>1</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> <tr> <td>Number of consultations conducted to support Tribal fish & wildlife conservation.</td> <td>1</td> </tr> </table>			Number of population assessments completed	1	Number of other Recovery Plan tasks implemented for T&E populations	1	Number of consultations conducted to support Tribal fish & wildlife conservation.
Number of population assessments completed	1						
Number of other Recovery Plan tasks implemented for T&E populations	1						
Number of consultations conducted to support Tribal fish & wildlife conservation.	1						

14330-A-004 - [Monitoring the spawning population of Snake River fall chinook salmon](#)

Facility	Idaho Fisheries Resource Office
Expended	\$41440
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Snake River Fall Chinook Salmon
Plans	2000 FWS Biological Opinion - Effects to Listed Species from Operations of the Federal Columbia River Power System
Keyword	Fish Technology
Need Number	N-002
Partners	Idaho Power Company Nez Perce Tribe

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	5
Number of consultations conducted to support Tribal fish & wildlife conservation.	1

Accomplishment Summary

We monitored spawning in the Snake River by conducting nine aerial surveys and searching 18 deepwater spawning areas using submersible cameras. A total of 2,127 redds were counted, and the data were distributed to cooperators.

Description

The importance to the Resource:

This project provides spawning distribution data used to determine if recovery thresholds are reached, if spawners are in peril (e.g., redd de-watering), and if the goals of management actions are realized (e.g., supplementing in river reaches).

The problem:

Snake River fall Chinook salmon are listed as a Threatened Species. Spawning surveys are needed to assess their status.

The objective:

The objective of this project is to document the spawning distribution of fall Chinook salmon in a 100 mile reach of the Snake River in Hells Canyon. While working with our partners, all redd-count data collected in the Snake River basin are compiled and disseminated in a summary report prepared by staff at the Idaho Fishery Resource Office.

The method:

The study reach is surveyed from a helicopter weekly, between mid-October and mid-December. In November and December, submersible cameras are used to locate redds in waters that are too deep to be effectively

	searched from the air. Effort to search deep-water areas is shared with our partners due to the large numbers of potential spawning sites.
--	--

14330-A-007 - [Federal Hydropower Fish and Wildlife Mitigation Program](#)

Facility	Idaho Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Increased the effectiveness of the Columbia River Hydropower Fisheries Mitigation Program.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Bonneville Power Administration spends approximately \$150 million annually on fish and wildlife mitigation.</p> <p>The problem:</p> <p>IFRO staff was assigned the lead role for USFWS representation on the Columbia Basin Fish and Wildlife Authority Resident Fish Committee (RFC) in 1999. Our participation ensures that Service priorities and needs are addressed in the FCRPS Fisheries Mitigation Program.</p> <p>The objective:</p> <p>Special emphasis needs to be placed on recovery needs of Bull Trout and Kootenai White Sturgeon in selecting projects for implementing the mitigation program.</p> <p>The method:</p> <p>IFRO staff will play an active role, and provide leadership to the Resident Fish Advisory Committee for the Columbia Basin Fish and Wildlife Authority.</p> <p>Further description:</p> <p>In 2005, we participated in a technical review of the Northwest Power and Conservation Council's proposed research plan for the Columbia Basin. We also played an active role</p>	
Expended	\$25000		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	(0) Multiple Species		
Primary Benefited Population	Not specified		
Plans	Kootenai River White Sturgeon Recovery Plan Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)		
Keyword	Mitigation		
Need Number	N-002		
Partners	Columbia Basin Fish and Wildlife Authority		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>2</td> </tr> </table>			Number of other Recovery Plan tasks implemented for T&E populations
Number of other Recovery Plan tasks implemented for T&E populations	2		

	<p>in the development and delivery of the 2005 International Kokanee Workshop and Resident Fish Conference in Spokane, WA. The RFC is currently developing a status report of resident fish populations in the Columbia River Basin.</p>
--	--

14330-A-022 - [Determining survival of Juvenile Fall Chinook Salmon in the Snake River during Winter](#)

Facility	Idaho Fisheries Resource Office
Expended	\$26485
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Snake River Fall Chinook Salmon
Plans	2000 NMFS FCRPS Biological Opinion - December 21, 2000
Keyword	Recovery
Need Number	N-002
Partners	Bonneville Power Administration U.S. Geological Survey Washington Department of Fish and Wildlife

Accomplishments

Number of population assessments completed	1
Number of other Recovery Plan tasks implemented for T&E populations	1
Number of applied aquatic scientific and technologic tools shared with partners.	1

Accomplishment Summary

We verified winter passage of fall Chinook salmon when the juvenile fish bypass systems were not operated in the Snake River portion of the FCRPS.

Description

The importance to the Resource:

This project will help to recover Snake River fall Chinook salmon listed as threatened under the ESA. It was identified as research activity 4.3 and as RPA 199 in the 2000 Federal Columbia River Power System (FCRPS) Biological Opinion.

The problem:

The fish passage facilities at Snake River dams are not operated in the winter, thus winter migrants pass via the turbine intakes and are susceptible to turbine related injury and death. Little is known about fall Chinook salmon passage at Snake River dams in the winter.

The objective:

The objective of this project is to determine if the absence of juvenile fish bypass at Snake River dams in the winter is affecting survival of fall Chinook salmon juveniles.

The method:

We are using radio telemetry to monitor the winter movement of fall Chinook salmon juveniles in the Snake River portion of the FCRPS.

14330-A-026 - [Improving Kooskia NFH Evaluation and Long Term Monitoring of Listed Species.](#)

Facility	Idaho Fisheries Resource Office
Expended	\$20000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	South Fork Clearwater River
Plans	Kooskia NFH Weir Reconstruction - Biological Opinion 1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin.
Keyword	Monitoring and Assessment
Need Number	N-002
Partners	

Accomplishments

Number of population assessments completed	1
Number of other Recovery Plan tasks implemented for T&E populations	5

Accomplishment Summary

We collected information on listed bull trout and summer steelhead during the summer as spring chinook salmon broodstock were collected at the weir. All individuals of listed species were placed above the weir after data collection. We also collected information on the numbers and timing of downstream migrating steelhead smolts with the rotary screw trap. Snorkel surveys were conducted in the upper reaches of Clear Creek to collect data on numbers and distribution of bull trout.

Description

The importance to the Resource:

Monitoring and evaluating weir operations at Kooskia NFH is important to insure that listed bull trout and wild steelhead are not impeded or harmed during seasonal migrations into and out of Clear Creek.

The problem:

Clear Creek is completely blocked by a mechanical weir to facilitate the collection of spring chinook salmon for broodstock. However, weir operations have a high potential for the prevention of, or the delay in, migration of bull trout and wild summer steelhead into and out of Clear Creek during spawning or smolt out migration.

The objective:

Modifications in the weir design and operations have been made in order to reduce the potential impingement of listed fish migrating downstream and the delay of fish migrating up stream. The objective is to continue monitoring the effectiveness of the modifications and to improve operations whenever possible.

	<p>The <i>method</i>:</p> <p>Data on the numbers and distribution of bull trout and summer steelhead in Clear Creek will be compiled seasonally by snorkeling and trapping upstream of the hatchery. These data will be used in comparison with the numbers and migration timing of these species as they are collected during weir operations to determine operations effectiveness.</p>
--	--

14330-A-027 - [Evaluate bull trout passage at the Lower Snake River Dams](#)

Facility	Idaho Fisheries Resource Office
Expended	\$87200
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Tucannon River
Plans	2000 FWS Biological Opinion - Effects to Listed Species from Operations of the Federal Columbia River Power System
Keyword	Recovery
Need Number	N-002
Partners	Washington Department of Fish and Wildlife

Accomplishments

Number of population assessments completed	1
Number of other Recovery Plan tasks implemented for T&E populations	1

Accomplishment Summary

We verified the movement of bull trout into the Federal Hydropower System on the Lower Snake River. Radio-tagged bull trout from the Tucannon River moved into Lower Monumental Pool during the winter months, and returned to the Tucannon River in early spring.

Description

The importance to the Resource:

This project will provide useful information for bull trout recovery planning and hydrosystem effects determinations for threatened bull trout. This activity was identified as an RPA in the 2000 FCRPS BiOp.

The problem:

The fish passage facilities at the Snake River dams were designed for the passage of anadromous fish. Little is known about bull trout use of the Hydropower System on the Lower Snake River, or how the FCRPS may affect the movements of bull trout.

The objective:

The objective of this project is to determine if the Hydropower System on the Lower Snake River has affected the capability of Tucannon River bull trout to freely move through the Lower Snake River dams and return to the Tucannon River to spawn.

The method:

We are using radio-telemetry to monitor the movements of adult bull trout when they leave the Tucannon subbasin and move into the main stem Snake River in the winter and

	<p>spring. We also use fixed station data loggers to monitor movements in the lower Tucannon River, and near Snake River dams.</p>
--	--

Further description:

14330-A-033 - [East Fork American River Culvert Replacement](#)

Facility	Idaho Fisheries Resource Office
Expended	\$1
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	South Fork Clearwater
Plans	Bull Trout Recovery Plan, Ch 16 Clearwater RU
Keyword	Fish Passage
Need Number	N-002
Partners	Bureau of Land Management (\$10000)

Accomplishments

Fish passage barriers removed or bypassed	1
Number of other Recovery Plan tasks implemented for T&E populations	2

Accomplishment Summary

All work completed during summer of 2006 includes (1) culvert removed, new bridge constructed; (2) rock upstream v check dam, and large woody debris installed in American River, mouth area E. Fk. American River; (3) all initial erosion control, mulching, seeding completed, and (4) road gravelled. Follow-up for revegetation scheduled for fall 2006. This project is complete. Project was funded with \$19,000 FY05 funds, on-the-ground work was not completed until FY06.

Description

The importance to the Resource:

The East Fork American River provides habitat for steelhead trout, spring/summer Chinook salmon, and bull trout (adult/subadult foraging). This stream is 4 - 5 C cooler than American River, and provides an important thermal refuge during the summer months.

The problem:

A round culvert installed in 1984 at the mouth is currently a partial/full fish passage barrier, restricting movement of spring/summer Chinook, steelhead trout and bull trout into the drainage during low flows. During high spring flows a velocity barrier occurs in this culvert.

The objective:

Remove the barrier culvert and associated fill materials and replace it with a bridge, enabling passage of all aquatic organisms at all flows.

The method:

The culvert will be replaced with a bridge, eroding fill will be removed, and habitat

	<p>structures will be placed in American River near the mouth of the East Fork American River.</p> <p>Further description:</p>
--	---

14330-A-036 - [Updated Review on Bull Trout Assessments and Radio-telemetry Studies](#)

Facility	Idaho Fisheries Resource Office
Expended	\$50000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Not specified
Plans	Bull Trout Recovery Plan, Ch 18 Southwest Idaho RU Bull Trout Recovery Plan, Ch 16 Clearwater RU
Keyword	Recovery
Need Number	N-002
Partners	Boise State University (\$15000) U.S. Bureau of Reclamation (\$32000)

Accomplishments

Number of habitat assessments completed	1.0
Number of other Recovery Plan tasks implemented for T&E populations	1
Number of applied aquatic scientific and technologic tools shared with partners.	1
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1

Accomplishment Summary

Data from three different studies was synthesized and analyzed. The November 2006 final report will include a discussion of the case studies, data collection and analysis, as well as the types of questions we have asked in the past, how these data have been used, and what types of questions we can ask given the data we have collected. The report will culminate in some guidelines for conducting future studies grounded in the question of interest. All monies have been expended.

Description

The problem:

Much data on bull trout has been collected since previous reviews were done. In particular, many studies involving radio telemetry that help characterize life history, movements and habitat preferences have been conducted. Analysis and review beyond individual studies or watersheds has not been done.

The objective:

Assimilate and synthesize the existing data regarding bull trout habitat use and movement into a database and several peer-reviewed articles, which will fill a void in the literature associated with broad-scale questions of bull trout biology and ecology.

The method:

Survey biologists conducting bull trout radio telemetry studies over the range of the species, update what is known about bull trout and make it readily available for managers and recovery planning.

14330-A-039 - [Culvert Rehabilitation on Deep Creek, Panther Creek Watershed, Lemhi County, Idaho](#)

Facility	Idaho Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Funds once dedicated to this project are now being used to fund the Twin Creek Culvert replacement. The Twin Creek culvert is still in the original and currently valid agreement. Funds expected from the Federal Highways Fund for the Deep Creek project were rescinded by Washington Office USFS. Project design and environmental compliance documents have been finalized. Construction is on hold until additional funds are secured. Project is funded with \$65,000 FY05 funds.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Twin Creek drainage is a population stronghold for bull trout, steelhead and westslope cutthroat trout in the North Fork Salmon watershed.</p> <p>The problem:</p> <p>The existing culvert on Road #449 is a barrier to fish passage due to the high flow velocity and low flow depth through the culvert and outlet jump.</p> <p>The objective:</p> <p>Restore all life stages of fish passage and open up over 6 miles of fluvial fish habitat for the bull trout, steelhead, cutthroat trout, and potentially Chinook salmon and minimize sediment in Twin Creek presently generated by erosion downstream of the existing culvert.</p> <p>The method:</p> <p>The existing culvert will be replaced with either a bridge or open arch culvert, restoring historic</p>	
Expended	\$1		
Objective	Expand the use of Fisheries Program expertise to avoid, minimize, or mitigate impacts of habitat alteration on fish and other aquatic species.		
Primary Benefited Species	Bull trout (Salvelinus confluentus)		
Primary Benefited Population	Middle Salmon-Panther		
Plans	Bull Trout Recovery Plan, Ch 17 Salmon RU		
Keyword	Fish Passage		
Need Number	N-002		
Partners	Salmon-Challis National Forest (\$35000)		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> </table>			Number of other Recovery Plan tasks implemented for T&E populations
Number of other Recovery Plan tasks implemented for T&E populations	1		

	access to habitat for bull trout, steelhead trout and cutthroat trout.
--	--

14330-A-040 - [Culvert Rehabilitation on Jackson Creek, Little Lost River Drainage, Custer County, Idaho](#)

Facility	Idaho Fisheries Resource Office
Expended	\$1
Objective	Expand the use of Fisheries Program expertise to avoid, minimize, or mitigate impacts of habitat alteration on fish and other aquatic species.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Little Lost River
Plans	Bull Trout Recovery Plan, Ch 19 Little Lost RU
Keyword	Fish Passage
Need Number	N-002
Partners	Salmon-Challis National Forest (\$20000)

Accomplishments

Number of miles re-opened to fish passage	2.0
Fish passage barriers removed or bypassed	1
Number of other Recovery Plan tasks implemented for T&E populations	1

Accomplishment Summary

Culvert was replaced in August 2006. This project is complete. Project was funded with \$39,800 FY05 funds, on-the-ground work was completed in FY06.

Description

The importance to the Resource:

Jackson Creek is currently occupied by a resident bull trout population and it is likely that fluvial bull trout historically used the stream for spawning and rearing.

The problem:

The culvert on Jackson Creek has been evaluated and found to be a complete barrier to fish passage. Thus the culvert has isolated a resident bull trout population above the culvert and also prevents fluvial bull trout from accessing the stream above the culvert.

The objective:

Restore access for resident and fluvial bull trout to the stream above the culvert

The method:

Replace the existing culvert with a larger baffled pipe

14330-A-041 - [Culvert Rehabilitation on Timber Creek, Little Lost River Drainage, Custer County, Idaho](#)

Facility	Idaho Fisheries Resource Office
Expended	\$1
Objective	Expand the use of Fisheries Program expertise to avoid, minimize, or mitigate impacts of habitat alteration on fish and other aquatic species.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Little Lost River
Plans	Bull Trout Recovery Plan, Ch 19 Little Lost RU
Keyword	Fish Passage
Need Number	N-002
Partners	Salmon-Challis National Forest (\$5000)

Accomplishments

Number of miles re-opened to fish passage	5.0
Fish passage barriers removed or bypassed	1
Number of other Recovery Plan tasks implemented for T&E populations	1

Accomplishment Summary

Project design and environmental compliance documents are completed. Culvert retrofit will be completed in September 2006. Project was funded with \$30,000 FY05 funds, on-the-ground work was completed in FY06.

Description

The importance to the Resource:

Timber Creek between the Little Lost River and Redrock Creek is occupied by resident bull trout and may serve as a spawning and rearing area and migratory corridor for fluvial bull trout.

The problem:

This culvert has been evaluated and is believed to restrict the upstream movement of small resident and fluvial bull trout.

The objective:

Restore upstream passage for resident and fluvial bull trout.

The method:

The existing culvert will be retrofitted with baffles that will function to create velocity refuges for upstream migrating bull trout.

14330-A-044 - [Road #40101, Culvert Rehabilitation on Main Fork, Little Lost Watershed, Lemhi County, Idaho](#)

Facility	Idaho Fisheries Resource Office
Expended	\$1
Objective	Expand the use of Fisheries Program expertise to avoid, minimize, or mitigate impacts of habitat alteration on fish and other aquatic species.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Little Lost River
Plans	Bull Trout Recovery Plan, Ch 19 Little Lost RU
Keyword	Fish Passage
Need Number	N-002
Partners	Salmon-Challis National Forest (\$5000)

Accomplishments

Number of miles re-opened to fish passage	10.0
Fish passage barriers removed or bypassed	1
Number of other Recovery Plan tasks implemented for T&E populations	1

Accomplishment Summary

Project design and environmental compliance documents are completed. Culvert retrofit will be completed in September 2006. Project was funded with \$38,000 FY05 funds, on-the-ground work was completed in FY06.

Description

The importance to the Resource:

The mainstem Little Lost River between Timber Creek and Smithie Fork is occupied by resident bull trout, serves as a spawning and rearing area for fluvial bull trout, and is used as a migratory corridor by fluvial bull trout.

The problem:

The lower of culvert on road #40101 has been evaluated and is believed to restrict the upstream movement of small resident and fluvial bull trout.

The objective:

Restore upstream access for resident and fluvial bull trout.

The method:

The existing culvert will be retrofit with baffles that will function to create velocity refuges for upstream migrating bull trout.

14330-A-050 - [Determine proportion of hatchery steelhead to ESA-listed stocks in the Snake River basin.](#)

Facility	Idaho Fisheries Resource Office
Expended	\$26000
Objective	Support, facilitate, and/or lead collaborative approaches to manage interjurisdictional fisheries.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	North Fork Clearwater River
Plans	2005-2007 Interim Management Agreement for Upriver Chinook, Sockeye, Steelhead, Coho, and White Sturgeon
Keyword	Interjurisdictional
Need Number	N-002
Partners	Idaho Department of Fish and Game Nez Perce Tribe

Accomplishments

Number of population assessments completed	1
Number of Fishery Management Plan production tasks implemented (PART)	3
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1

Accomplishment Summary

A total of 2698 scale samples have been collected from return years 2002- 2006. Of those, 428 have been cleaned, 290 have been scanned, and 147 have been read and measured. Twelve scale features were analyzed for hatchery origin indicators, and a model was developed using 6 of these. This model had good accuracy, but poor repeatability. A new model is being developed that will focus on only 1 or 2 features. The new model will address many limitations of the previous model.

Description

The importance to the Resource:

Since the early 1980s all hatchery steelhead in the Columbia basin have had their adipose fin clipped to identify them as hatchery fish suitable for sport harvest. Beginning in 2000, unclipped, unmarked hatchery steelhead have been released in the Snake River basin as part of an agreement between the tribes, states, and federal agencies.

The problem:

Returning adults are counted as wild or hatchery based upon presence or absence of the adipose fin. Unclipped hatchery fish are counted as wild, thereby inflating wild adult counts. Without adjustment, recovery cannot be accurately measured. There are no quantifiable methods to determine between hatchery and wild steelhead.

The objective:

There is a compelling need to account for the proportion of unclipped hatchery fish in wild

adult steelhead returns in the Snake River basin.

The *method*:

Scales were collected from returning adult steelhead at Lower Granite Dam. We are using scale pattern analysis to develop a quantifiable model distinguishing between hatchery and wild steelhead in run years 2002-2006. Data will be applied to future return years and used to monitor recovery of listed wild steelhead in the Snake River basin.

14330-A-053 - [Evaluate bull trout migration using streamwidth PIT tag interrogation systems.](#)

Facility	Idaho Fisheries Resource Office
Expended	\$37500
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Not specified
Plans	Bull Trout Recovery Plan, Ch 24 Snake River Washington RU 2000 FWS Biological Opinion - Effects to Listed Species from Operations of the Federal Columbia River Power System
Keyword	Recovery
Need Number	N-002
Partners	Biomark Washington Department of Fish and Wildlife

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	3
---	---

Accomplishment Summary

We sampled and PIT-tagged an additional 136 juvenile and subadult bull trout within the tributaries and the mainstem Tucannon River. We conducted bi-weekly visits to the antenna arrays for data downloads and to check for maintenance problems.

Description

The importance to the Resource:

This study provides resource managers data pertaining to the utilization of the FCRPS by bull trout originating from the Tucannon River for incorporation into management decisions and recovery planning.

The problem:

Bull trout are believed to migrate between the Tucannon River and the mainstem Snake River; however, the extent to which FCRPS operations effect the migratory behaviors of bull trout is unknown.

The objective:

The objectives of this study are to determine (1) if bull trout migrate between the Tucannon River and the Snake River, (2) migration timing, (3) the relative proportion of the Tucannon River population that utilizes the mainstem Snake River and (4) the utilization of lower Snake River dam fishways by bull trout.

The method:

We have installed streamwidth PIT antennas at the mouth of the Tucannon River to track the movement of bull trout between the Tucannon River and the mainstem Snake River. PIT tag antennas within the FCRPS facilities provide

	data regarding the passage of PIT-tagged bull trout through the juvenile and adult facilities.
--	--

14330-A-056 - [Boulder Creek Yantis Ditch](#)

Facility	Idaho Fisheries Resource Office	<p>Accomplishment Summary</p> <p>One rotary drum screen was installed on an irrigation ditch to prevent entrainment of threatened steelhead trout and bull trout populations. All work has been completed. Project was funded with \$5,700 FY05 funds, on-the-ground work was completed in FY06.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Boulder Creek provides spawning and rearing for listed bull trout and steelhead trout.</p> <p>The problem:</p> <p>The Yantis Ditch on Boulder Creek has been out of operation due to ESA concerns. The irrigators desire to use the diversion again, but before they can do that the ditch needs to be screened to prevent entrainment of bull trout and steelhead trout.</p> <p>The objective:</p> <p>Allow legal irrigation to continue and prevent loss of listed species down the diversion.</p> <p>The method:</p> <p>Rebuild the irrigation headgate and install a fish screen on the Yantis Ditch.</p>	
Expended	\$1		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	Bull trout (Salvelinus confluentus)		
Primary Benefited Population	Little Lower Salmon River		
Plans	Bull Trout Recovery Plan, Ch 17 Salmon RU		
Keyword	Fish Passage		
Need Number	N-002		
Partners	Adams County Soil and Water Conservation District Idaho Department of Fish and Game (\$7300) Payette National Forest (\$1638)		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> </table>			Number of other Recovery Plan tasks implemented for T&E populations
Number of other Recovery Plan tasks implemented for T&E populations	1		

14330-A-057 - [Little Lost River Fish Passage Jim Andreason](#)

Facility	Idaho Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Rock weir diversion was replaced with concrete channel spanning diversion structure with fish ladder. All work is complete. Project was funded with \$34,940 FY05 funds, on-the-ground work was completed in FY06.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Little Lost River drainage has an isolated population of listed bull trout.</p> <p>The problem:</p> <p>The mainstem Little Lost River has several irrigation diversions, several which are rock weirs that block upstream passage during low flows.</p> <p>The objective:</p> <p>Restore passage over irrigation dam.</p> <p>The method:</p> <p>Replace existing rock headgate with concrete structure and associated fish ladder.</p>	
Expended	\$1		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	Bull trout (Salvelinus confluentus)		
Primary Benefited Population	Not specified		
Plans	Bull Trout Recovery Plan, Ch 19 Little Lost RU		
Keyword	Fish Passage		
Need Number	N-002		
Partners	Andreason Family (\$2400) Idaho Department of Fish and Game (\$4347) Trout Unlimited (\$12400)		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> </table>			Number of other Recovery Plan tasks implemented for T&E populations
Number of other Recovery Plan tasks implemented for T&E populations	1		

14330-A-060 - [Goat Creek Culvert Replacement, South Fork Salmon River, Payette National Forest, Idaho](#)

Facility	Idaho Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Project design, environmental compliances and associated activities are completed. The contract will be awarded September 2006, construction will start July 2007 and be completed by November 2007.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Goat Creek is a tributary of the South Fork Salmon River (SFSR). Before the construction of the SFSR Road in 1953, Goat Creek likely provided up to 1.2 miles of habitat for Chinook salmon, steelhead, bull trout, and westslope cutthroat trout. The South Fork Salmon River is an important spawning and rearing area for these species as well.</p> <p>The problem:</p> <p>The SFSR road crossing at the mouth of Goat Creek is an 8-foot diameter culvert, which drops about 7 feet directly onto rocks in the SFSR. The culvert has resulted in significant sediment deposits upstream of the culvert, and a complete barrier to fish migration into Goat Creek.</p> <p>The objective:</p> <p>Replace the culvert, reconnect the habitat and remove 3700 cubic meters of road fill that continually erodes into the SFSR, impacting spawning and rearing habitat.</p> <p>The method:</p> <p>Replace the Goat Creek culvert with an open-bottomed structure that will reconnect the 1.20 miles of habitat for listed fishes upstream of the</p>	
Expended	\$10152		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)		
Primary Benefited Population	South Fork Salmon River		
Plans	Bull Trout Recovery Plan, Ch 17 Salmon RU		
Keyword	Fish Passage		
Need Number	N-002		
Partners	Payette National Forest (\$840000)		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>2</td> </tr> </table>			Number of other Recovery Plan tasks implemented for T&E populations
Number of other Recovery Plan tasks implemented for T&E populations	2		

	<p>culvert.</p> <p>Further description:</p>
--	--

14330-A-062 - [Rattlesnake Creek, Idaho Culvert Replacement](#)

Facility	Idaho Fisheries Resource Office
Expended	\$35123
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Payette River
Plans	Bull Trout Recovery Plan, Ch 18 Southwest Idaho RU
Keyword	Fish Passage
Need Number	N-002
Partners	Boise National Forest (\$80000) Southwest Idaho Resource Advisory Committee (\$35000) Trout Unlimited (\$1000)

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	1
---	---

Accomplishment Summary

Additional funding was secured to cover increased costs of the project. The project will be implemented in 2007.

Description

The importance to the Resource:

There are only two strong populations of bull trout in the Middle Fork Payette River. Currently, access to spawning and rearing habitat is not available on Rattlesnake Creek. This access is important to maintain and expand bull trout populations in the Middle Fork Payette River.

The problem:

The Rattlesnake crossing is located approximately 10 miles north of Crouch, Idaho on Forest Service road #698 near the confluence of Rattlesnake Creek and the Middle Fork Payette River. The 2004 Region 4 Aquatic Organism Passage Inventory Project identified the culvert as a barrier to all life stages of fishes.

The objective:

Provide access to 12 miles of quality spawning and rearing habitat in the Rattlesnake Creek drainage.

The method:

Replace two culverts with fish passable, natural bottom structure.

14330-A-067 - [Restore/Recover Bull Trout in 6 miles of Mores Creek, ID per NFHI/WNTI management habitat priorities](#)

Facility	Idaho Fisheries Resource Office
Expended	\$12500
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Boise River
Plans	Bull Trout Recovery Plan, Ch 18 Southwest Idaho RU
Keyword	Habitat
Need Number	N-002
Partners	<p>City of Idaho City, Idaho (\$7000)</p> <p>Idaho Department of Fish and Game (\$8000)</p> <p>Southwest Idaho Resource Advisory Committee (\$177000)</p>

Accomplishments

Number of riparian miles restored	6.0
Number of other Recovery Plan tasks implemented for T&E populations	1

Accomplishment Summary

Service funds were used to partially fund floodplain restoration, purchase native plants and salvage native plants that will be replanted in the floodplain. Revegetation will be done in fall 2006 and spring 2007

Description

The importance to the Resource:

Mores Creek is a migration corridor for bull trout and redband trout, and the headwater reaches are important for spawning and rearing for these two species.

The problem:

Mores Creek was extensively dredge-mined in the early and mid 1900's. Dredge piles confine the channel, altering the hydrology and floodplain function. There is a lack of vegetation and woody debris to provide habitat, thermal cover and channel integrity. Elevated water temperatures often are a thermal block to upstream passage.

The objective:

Restore Mores Creek to a naturally functioning ecosystem, with bank and instream integrity, vegetation and habitat so that spawning and rearing capacities for bull trout and redband trout are improved.

The method:

- 1) Excavate and isolate mine tailings from Mores Creek;
- 2) revegetate the floodplain with wetland trees, shrubs and grasses;
- 3) introduce large woody debris and boulders to modify the hydrology that now consists of long

	<p>straight runs lacking pool and riffle structure. This project will restore 6 miles of bank and instream habitat integrity.</p>
--	---

14330-A-069 - [Restoring/Recovering Bull Trout in 8 miles of Little Lost River, ID per WNTI management priorities.](#)

Facility	Idaho Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Consultant was hired to design the restoration project. Designs are being finalized, and construction will occur after the irrigation season in fall 2006.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Little Lost River has an isolated population of listed bull trout, and Badger Creek is an important spawning and rearing stream in the drainage.</p> <p>The problem:</p> <p>The existing irrigation diversion on private property is a complete barrier to upstream passage, and irrigation withdrawals totally dewater the stream below the diversion. Paast land use has altered the riparian vegetation and habitat within Badger Creek. Bull trout cannot access the headwaters of Badger Creek.</p> <p>The objective:</p> <p>Restore passage into Badger Creek from the Little Lost River, and improve riparian and instream habitat that has been impacted by previous land use.</p> <p>The method:</p> <p>1) remove the existing diversion on Badger Creek, which is a passage barrier; 2) reconnect Badger Creek, which is currently diverted and isolated from the Little Lost River, back to the Little Lost River; 3) revegetate the reconstructed Badger Creek channel; 4) fence Badger Creek from cattle grazing.</p>
Expended	\$8206	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Bull trout (Salvelinus confluentus)	
Primary Benefited Population	Little Lost River	
Plans	Bull Trout Recovery Plan, Ch 19 Little Lost RU	
Keyword	Habitat	
Need Number	N-002	
Partners		

14330-A-070 - [Roaring River Fish Passage Restoration Project Previously 14330-2005-006](#)

Facility	Idaho Fisheries Resource Office
Expended	\$1
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Boise River
Plans	Bull Trout Recovery Plan, Ch 18 Southwest Idaho RU
Keyword	Fish Passage
Need Number	N-002
Partners	Boise National Forest (\$191443) Southwest Idaho Resource Advisory Committee (\$110000)

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	1
---	---

Accomplishment Summary

Project costs came in above original projections. Additional funds have been secured and work will start in the fall of 2006.

Description

The importance to the Resource:

Provide access to 35 miles of perennial stream habitat for bull trout and other aquatic organisms.

The problem:

Current culvert is a complete migration barrier to bull trout and other aquatic organisms.

The objective:

Remove the migration barrier and restore passage to bull trout and other aquatic organisms in the Roaring River drainage.

The method:

This project will replace a major (15 feet diameter) culvert with a bottomless arch culvert or bridge on Forest Road 255.

Further description:

Removal of the barrier will open up 18 miles of habitat to bull trout and provide access to 35 miles of perennial stream for other fish and aquatic organisms. Gene flow will be restored to the isolated bull trout population and the potential for catastrophic events to impact impact the population will be reduced.

14330-A-073 - [Measuring the Reproductive Success of Hatchery Fall Chinook Salmon in the Snake River](#)

Facility	Idaho Fisheries Resource Office
Expended	\$30500
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Snake River Fall Chinook Salmon
Plans	2000 NMFS FCRPS Biological Opinion - December 21, 2000
Keyword	Recovery
Need Number	N-002
Partners	Bonneville Power Administration Idaho Power Company

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	1
---	---

Accomplishment Summary

We provided Washington Department of Fish and Wildlife with tissue samples from 62 fall Chinook salmon collected after spawning in the Snake River.

Description

The importance to the Resource:

This project will help to recover of Snake River fall Chinook salmon listed as threatened under the ESA. It was requested in the 2000 Federal Columbia River Power System (FCRPS) Biological Opinion, which called for quantitative results on the relative reproductive success of hatchery fish spawning in the wild.

The problem:

Millions of hatchery fall Chinook salmon juveniles have been released into the wild to return and spawn as adults. The spawning success of the returning hatchery adults is unknown. To remove Snake River fall Chinook salmon from the list of threatened species, the extent of the reproductive success of the hatchery spawners must be known.

The objective:

The objective of this project is to determine if hatchery fall Chinook salmon spawners in the Snake River produce viable offspring that eventually return and spawn successfully.

The method:

We collect fall Chinook salmon after they spawn and provide tissue samples for analyses by geneticists from the Washington Department of Fish and Wildlife.

14330-A-074 - [Increasing the Survival of Snake River Fall Chinook Salmon with Summer Spill](#)

Facility	Idaho Fisheries Resource Office
Expended	\$51000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Snake River Fall Chinook Salmon
Plans	2000 NMFS FCRPS Biological Opinion - December 21, 2000
Keyword	Recovery
Need Number	N-002
Partners	NOAA Fisheries Nez Perce Tribe U.S. Army Corps of Engineers, Walla Walla District

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	1
---	---

Accomplishment Summary

We provided the first year of data needed to determine if summer spill increases juvenile fall Chinook salmon survival as they pass downstream in the Snake River portion of the FCRPS.

Description

The importance to the Resource:

This project will help to recover of Snake River fall Chinook salmon listed as threatened under the ESA. It was requested in the 2000 Federal Columbia River Power System (FCRPS) Biological Opinion, which called for a determination of the efficacy of summer spill.

The problem:

The migrational corridor of juvenile Snake River fall Chinook salmon was impounded by eight dams comprising the FCRPS. To increase passage survival, summer water passed via the spillways of the four lower Snake River dams was legally mandated. This reduced power revenues by \$69M. Analyses were needed to evaluate the efficacy of summer spill.

The objective:

The objective of this project is to determine if spilling water at the four lower Snake River dams increases survival of Snake River fall Chinook salmon juveniles.

The method:

We are rearing 328,000 hatchery fall Chinook salmon juveniles at Dworshak National Fish Hatchery, implanting them with passive integrated transponder tags (PIT tags) prior to

	release, and monitoring downstream passage survival in the FCRPS to determine if spill increases survival.
--	--

13230-A-107 - [Rear endangered White River spring chinook to promote ESA recovery](#)

Facility	Little White Salmon National Fish Hatchery
Expended	\$0
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Wenatchee River (UCWEN) spring chinook salmon
Plans	Wenatchee Subbasin Plan Priest Rapids Project Salmon and Steelhead Settlement Agreement
Keyword	Recovery
Need Number	N-002
Partners	AquaSeed, Inc. (\$960) Grant County Public Utility District (\$1818) National Oceanic and Atmospheric Administration, Fisheries Washington Department of Fish and Wildlife

Accomplishments

Number of Fishery Management Plan production tasks implemented (PART)	2
Number of other Fishery Management Plan	1

Accomplishment Summary

Initiated the rearing of endangered White River spring Chinook in partnership with Public Utility District No. 2 of Grant County, AquaSeed, Inc., and the Washington Department of Fish & Wildlife to move toward recovery of this spawning aggregation of the Upper Columbia River Spring-run Chinook Salmon ESU.

Description

The importance to the Resource:

Without hatchery intervention to hold and spawn captive broodstock and to rear progeny for transfer back to the White River, this population would become extinct.

The problem:

The White River spring Chinook spawning aggregation is severely depressed and persistently experiences escapement levels below critical population thresholds. The White River spawning aggregation is within the Upper Columbia River Spring-run Chinook Salmon ESU which is listed as Endangered (FR Vol. 64, No. 56, March 24, 1999).

The objective:

Prevent the extinction of, conserve, and ultimately recover the naturally spawning White River spring Chinook spawning aggregation. This recovery program has been incorporated into the mitigation responsibilities of Public Utility District No. 2 of Grant County through their Biological Opinion (dated May 3, 2004).

The method:

The White River captive broodstock are currently held at AquaSeed, Inc., a private fish

tasks implemented for populations of management concern.

hatchery. Production goals identified in the Grant County PUD Biological Opinion exceed available rearing space at AquaSeed. Little White Salmon NFH currently has adequate space to assume responsibility for rearing progeny to assist with recovery efforts.

Further description:

Participation in the White River spring Chinook rearing program using facilities at the Little White Salmon/Willard NFH Complex was initiated with the transfer of 54,000 brood year 2005 fish and gametes from the 2006 captive brood year spawned at AquaSeed, Inc. This recovery program is identified as a mitigation requirement of the Grant County PUD in the Priest Rapids Biological Opinion and Priest Rapids Salmon and Steelhead Settlement Agreement. Production is coordinated with the multi-partner Priest Rapids Coordinating Committee - Hatchery Subcommittee and with the Public Utility District No. 2 of Grant County. The production program at Little White Salmon NFH adheres to the rearing density and fish health guidelines specified in the September 2005 White River Hatchery and Genetics Management Plan. All costs associated with this program will be recovered from Grant County PUD.

13231-A-022 - [Ecological Interactions between Hatchery and Wild Fish in the Wind River, WA](#)

Facility	Lower Columbia River Fish Health Center	<p>Accomplishment Summary</p> <p>The interaction, habitat use, and disease status of hatchery salmon and wild steelhead in the Wind River has been done. No fish health problems have been found thus far. According to PIT tag data, the young hatchery salmon that reared naturally in the river in 2005-6 survived and migrated to Bonneville Dam. This year's crop of salmon have a poor survival rate, likely due to the big spring rains and river flush-outs. This information is available for management decisions.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Valuable tribal, sport and commercial fishing is provided by Chinook salmon from Carson National Fish Hatchery on the Wind River in the Columbia River Basin. However, these fish are not native to the river and may interfere with the native-borne steelhead which are a threatened population. Results from this work apply to other NW basins.</p> <p>The problem:</p> <p>Concerns have been raised whether current salmon management practices (leaving some hatchery salmon in the river to spawn outside the hatchery) are limiting the recovery of steelhead. This may have disease and competition implications that could be easily avoided.</p> <p>The objective:</p> <p>Determine if the Carson salmon fry that rear naturally in the Wind River are a source of competition and/or disease for the native steelhead, the original inhabitants of the Wind River in WA.</p>
Expended	\$24083	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)	
Primary Benefited Population	Wind River summer run steelhead	
Plans	<p>Carson NFH Spring Chinook Salmon Hatchery and Genetic Management Plan</p> <p>National Wild Fish Health Survey</p> <p>1999 NMFS Biological Opinion on Artificial Propagation in the Columbia River Basin.</p> <p>2000 NMFS FCRPS Biological Opinion - December 21, 2000</p> <p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>Comprehensive Hatchery Management Plan - Carson NFH</p>	
Keyword	Recovery	
Need Number	N-002	
Partners	U. S. Forest Service U.S. Geological Survey,	

Columbia River Research Lab
 (\$12000)
 Underwood
 Conservation District
 Washington
 Department of Fish and
 Wildlife
 Yakama Indian Nation

The method:

The spawning habitat below and above the hatchery has been surveyed to ascertain the interactions, densities, habitat use and disease levels of salmon and steelhead. Salmon fry that have reared naturally in the river have been individually identified by PIT tags so that their survival can be tracked. Young salmon are checked for disease.

Further description:

Valuable tribal, sport and commercial fishing is provided by Chinook salmon from Carson National Fish Hatchery on the Wind River in the Columbia River Basin. However, these fish are not native to the river and may interfere with the native-borne steelhead which are a threatened population. Concerns have been raised whether current salmon management practices (leaving some hatchery salmon in the river to spawn outside the hatchery) are limiting the recovery of steelhead. Good progress has been made in FY06, the third year of this study. The spawning habitat below and above the hatchery has been surveyed by biologists to ascertain the interactions, densities, habitat use and disease levels of salmon and steelhead. Salmon fry that have reared naturally in the river have been individually identified by PIT tags so that their survival can be tracked. This contributes needed information to meet the Biological Opinions and the hatchery's Genetic and Management Plan. Tribal, state and USFWS entities can manage the Wind River to save and protect the native steelhead by minimizing negative interactions while providing highly valued salmon to tribal fisheries, Columbia River and Wind River recreational fisheries. FONS 2002-002

Accomplishments

Number of miles of in-stream habitat assessed	9.0
Number of population assessments completed	1
Number of other Recovery Plan tasks implemented for T&E populations	4
Number of post stocking survival tasks met as prescribed by Fishery Management Plans, for hatchery propagated depleted species (PART)	1
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	2

13231-A-028 - [White River Spring Chinook Salmon: Fish Health Care for Endangered Species Recovery Project](#)

Facility	Lower Columbia River Fish Health Center	<p>Accomplishment Summary</p> <p>The 2005 progeny of the endangered White River spring Chinook salmon are successfully rearing in their first year at the Little White Salmon NFH. Fish health, as measured by bi-weekly exams and special tests, show that this stock of salmon is doing well, with only minor incidence of bacterial kidney disease. A MOU with the Grant Co. Public Utility District for the care of these fish was achieved.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The White River spring Chinook salmon are listed as endangered. A scant 14 pairs of spawning adults were noted in past years in this upper Columbia Basin river.</p> <p>The problem:</p> <p>Deteriorating habitat, warm water conditions and dams have contributed to the near demise of this population.</p> <p>The objective:</p> <p>Recover the salmon through the use of a captive broodstock program and rear fish for restoration back into the White River in the upper Wenatchee Basin.</p> <p>The method:</p> <p>Bacterial kidney disease severely limits the viability of this stock in captivity. The Lower Columbia River Fish Health Ctr. is monitoring the stock at the Little White Salmon National Fish Hatchery and providing fish health care in attempts to produce viable smolts that can survive in the White River after their release</p>
Expended	\$7619	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Wenatchee River (UCWEN) spring chinook salmon	
Plans	U.S. Fish and Wildlife Service National Aquatic Animal Health Policy 2000 NMFS FCRPS Biological Opinion - December 21, 2000 Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper) Wenatchee Subbasin Plan	
Keyword	Fish Health	
Need Number	N-002	
Partners	Grant County Public Utility District Washington Department of Fish and Wildlife	

Accomplishments

Number of post-stocking survival tasks met, as prescribed by Recovery plans for hatchery propagated listed species. (PART)	1
Number of other Recovery Plan tasks implemented for T&E populations	1
Number of Fishery Management Plan production tasks implemented (PART)	1
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	1

from the hatchery.

13330-A-101 - [Fisheries Involvement in Five Dams on the Columbia River](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Increased survival of ESA-listed salmon at five Columbia River dams by participating in process to implement Habitat Conservation Plan measures including hatchery mitigation and fish passage studies at mainstem dams.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Ensures USFWS Fisheries involvement in the development and implementation of comprehensive fish passage and mitigation programs impacting listed species, tribal trust , and inter jurisdictional fisheries. These programs greatly facilitate recovery efforts targeting ESA-listed native salmonid stocks as well as hatchery produced stocks.</p> <p>The problem:</p> <p>The Columbia River hydrosystem has a demonstrated deleterious effect on survival of fish migrating through the system. These effects are numerous and include delayed migration, mortality at tubines and through concentration of predators below dams.</p> <p>The objective:</p> <p>This project ensures that FWS fisheries expertise is engaged in the development and implementation of fish passage survival improvements & hatchery and habitat mitigation programs associated with the Anadromous Fish Agreements and Habitat Conservation Plans for the Wells, Rocky Reach and Rock Island Hydroelectric Projects.</p> <p>The method:</p> <p>The Project Leader is the FWS's designated</p>
Expended	\$23406	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)	
Primary Benefited Population	Wenatchee River (UCWEN) population, part of the Upper-Columbia River steelhead ESU.	
Plans	<p>Federal Columbia River Power System 2002 Biological Opinion</p> <p>Priest Rapids Project Salmon and Steelhead Settlement Agreement</p> <p>Wells Dam Anadromous Fish Agreement and Habitat Conservation Plan</p> <p>Rock Island Anadromous Fish Agreement and Habitat Conservation Plan</p> <p>Rocky Reach Anadromous Fish Agreement and Habitat Conservation Plan</p>	
Keyword	Fish Passage	
Need Number	N-002	
Partners	<p>Chelan County Public Utility</p> <p>Douglas County Public</p>	

Utility District
National Marine
Fisheries Service
Washington
Department of Fish and
Wildlife
Yakama Indian Nation

representative on the HCP Coordinating and Hatchery Committees providing oversight on implementation of HCP agreements. The FRO also participates on the PRCC Hatchery and Coordinating Committee's. This work enhances efforts in developing mitigation and fish passage improvements at the Priest Rapids Project

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	2
Number of Fishery Management Plan production tasks implemented (PART)	4
Number of other Fishery Management Plan tasks implemented for populations of management concern.	8
Number of technical assistance requests fulfilled to support Tribal fish and wildlife conservation	1

Further description:

This project ensures that FWS fisheries expertise is engaged in the development of fish passage survival improvements & hatchery and habitat mitigation programs associated with the Anadromous Fish Agreements and Habitat Conservation Plans for the Wells, Rocky Reach, Priest Rapids and Rock Island Hydroelectric Projects operated by Douglas, Grant and Chelan County Public Utility Districts. The effort at each of these projects is needed to protect Columbia River salmon, two of which (Upper Columbia River spring Chinook salmon and steelhead) are currently listed under the ESA. Bull trout (a FWS Threatened species) are also present throughout this area. Benefit : Ensures USFWS Fisheries involvement in the development and implementation of comprehensive fish passage and mitigation programs impacting listed species, tribal trust , and inter jurisdictional fisheries.

13330-A-102 - [Fish Restoration and Tribal Trust Responsibilities in the Yakima River Basin](#)

Facility	Mid-columbia River Fisheries Resource Office
Expended	\$195288
Objective	Develop and improve long-term partnerships with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for aquatic resources.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	Upper Yakima River (YRUMA-s) . This population includes the Upper Yakima and its tributaries.
Plans	Bull Trout Draft Recovery Plan, Chapter 21 Yakima Subbasin Plan
Keyword	Monitoring and Assessment
Need Number	N-002
Partners	U. S. Forest Service U.S. Bureau of Reclamation Washington Department of Ecology Washington Department of Fish and Wildlife Yakama Indian Nation

Accomplishments

Number of habitat assessments completed	1.0
Number of miles of in-stream habitat	1.2

Accomplishment Summary

Increase survival of listed salmon, steelhead and bull trout in the Yakima River Basin through active participation on multi-agency technical and advisory committees.

Description

The importance to the Resource:

The Yakima Basin is home to 3 species of Pacific salmon, ESA-listed steelhead and bull trout, and many other native fish species. The basin was once one of the most prolific salmonid spawning and rearing areas in the Columbia River Basin. The loss of the Yakima Basin to the Columbia ecosystem, in terms of salmonid production, would be devastating.

The problem:

All salmonid populations have experienced precipitous declines from historic levels. Water storage and withdrawal for irrigation have severely altered the natural flow regime and impaired ecosystem function. Habitat loss and degradation has occurred as a result of land and water development in the basin

The objective:

The objective of the MCRFRO's efforts in the basin is to recover natural ecosystem processes where possible and to protect and restore essential habitats so that healthy wild native populations of fishes are distributed throughout their historic ranges.

The method:

Work collaboratively with all stakeholders, the Yakima Nation, other agencies and the USBR to address the issues. MCRFRO staff is active

assessed	
Number of other Recovery Plan tasks implemented for T&E populations	2
Number of other Fishery Management Plan tasks implemented for populations of management concern.	3
Number of applied science and technology tasks implemented as prescribed by Recovery Plans. (PART)	1

on numerous committees and technical advisory groups. They also conduct biological evaluations and participate in array of recovery efforts for both listed (bull trout and steelhead) and unlisted fish species.

Further description:

Mid-Columbia River Fishery Resource Office (MCRFRO) was active in 2006 in the Yakima River Basin with salmon, steelhead and bull trout restoration issues and related tribal trust responsibilities. Staff participated in bull trout presence/absence surveys and conducted bull trout and steelhead redd surveys in numerous rivers and creeks. An MCRFRO staff biologist represented the USFWS on the System Operations Advisory Committee which makes recommendations to the Bureau of Reclamation (USBR) Yakima Field Office Manager to minimize impacts to anadromous and resident fish resulting from Yakima Project operations. Staff participated as member of the Technical Advisory Group (TAG) for the USBR Yakima Basin Fish Passage Assessment, the Yakima Basin Salmon Recovery Board, the Ahtanum Creek watershed assessment, and the South Naches Irrigation District conservation planning board. Staff worked directly with managers of the Yakima River Basin Water Enhancement Project on biological evaluations of BOR operations and potential fish/water enhancement projects under consideration.

13330-A-103 - [Restoring fish passage into upper Icicle Creek](#)

Facility	Mid-columbia River Fisheries Resource Office
Expended	\$200000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	Wenatchee River (UCWEN) population, part of the Upper-Columbia River steelhead ESU.
Plans	Bull Trout Draft Recovery Plan, Chapter 21 Leavenworth Hatchery Genetics Management Plan USFWS Biological Opinion for the Operations and Maintenance of Leavenworth National Fish Hatchery
Keyword	Fish Passage
Need Number	N-002
Partners	Leavenworth National Fish Hatchery U.S. Bureau of Reclamation Washington Department of Fish and Wildlife

Accomplishments

Number of miles re-opened to fish passage	1.2
---	-----

Accomplishment Summary

We continued efforts to resolve issues and ESA compliance necessary to implement Phase II of the Icicle Creek Restoration Project at Leavenworth NFH. Biological The project, to restore fish passage and improve habitat conditions in Icicle Creek, has been unfortunately delayed to legal action and inability to resolve issues from certain parties.

Description

The importance to the Resource:

Restoring fish passage in Icicle Creek (past Leavenworth NFH) will help populations of ESA-listed steelhead and bull trout as well as non-listed native species.

The problem:

Leavenworth NFH has blocked most fish passage to areas upstream of the hatchery since construction about 1940. We have been pursuing long-term solutions but until certain issues are resolved with respect to the long term solution we will continue to seek opportunities to improve passage conditions.

The objective:

To provide passage opportunities to all non-hatchery fish into areas of Icicle Creek upstream of Leavenworth NFH without compromising hatchery broodstock collection or the Yakama Nation tribal fishery. as natural

The method:

We continue to meet with all parties to resolve disagreements regarding the optimum passage solution at the hatchery.

Number of habitat assessments completed	1.0
Number of miles of in-stream habitat assessed	3.0
Number of population assessments completed	1
Number of other Recovery Plan tasks implemented for T&E populations	4
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	1

Further description:

In FY 2006, the Mid-Columbia River Fishery Resource Office (MCRFRO) continued extensive effort working with partner's including Leavenworth National Fish Hatchery (LNFH), the Bureau of Reclamation, National Marine Fisheries Service, the Yakama Nation, Ecological Services, and the Washington Department of Fish and Wildlife to resolve disagreements over long-term passage solutions at the hatchery. Some short-term passage improvements have been implemented this year which are providing benefit to ESA-listed and native non-listed fish.

13330-A-104 - [Habitat availability and population trends of at risk anadromous and resident fish species.](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Completed salmon and bull trout spawning and habitat surveys in upper Columbia River tributaries, completed and distributed associated reports, and neared completion of a report on a 5-year radio telemetry tracking study of adult bull trout movements in Wenatchee River Basin.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The annual monitoring of salmon, steelhead and bull trout populations, their composition, and distribution throughout Upper Columbia River tributaries is critical for effective management of the resources.</p> <p>The problem:</p> <p>Effective resource management is often limited by insufficient data regarding fish populations, compositions, and distributions. The specific cause of the problem is most often limited funding for monitoring activities.</p> <p>The objective:</p> <p>The objective of this project is to annually survey the abundance and distribution of salmon, steelhead and bull trout populations, and their habitats, in key tributaries in the Upper Columbia Basin and provide this data to resource managers.</p> <p>The method:</p> <p>The MCRFRO conducts annual spawning ground surveys to determine abundance, composition (hatchery/wild) and distribution of salmon, steelhead and bull trout. Radio-</p>					
Expended	\$40000						
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.						
Primary Benefited Species	Bull trout (Salvelinus confluentus)						
Primary Benefited Population	Wenatchee River Bull Trout						
Plans	Bull Trout Draft Recovery Plan, Chapter 22 Entiat Hatchery Genetics Management Plan Entiat Subbasin Plan						
Keyword	Monitoring and Assessment						
Need Number	N-002						
Partners	U. S. Forest Service U.S. Bureau of Reclamation Washington Department of Fish and Wildlife						
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>3</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>2</td> </tr> <tr> <td>Number of other Fishery Management Plan</td> <td>2</td> </tr> </table>			Number of population assessments completed	3	Number of other Recovery Plan tasks implemented for T&E populations	2	Number of other Fishery Management Plan
Number of population assessments completed	3						
Number of other Recovery Plan tasks implemented for T&E populations	2						
Number of other Fishery Management Plan	2						

tasks implemented for populations of management concern.

telemetry studies provide additional data regarding bull trout migrations and habitat preferences throughout the Upper Columbia basin.

Further description:

In FY 2006, the Mid-Columbia River Fishery Resource Office, in cooperation with U.S. Forest Service (USFS) and Washington Dept. of Fish and Wildlife (WDFW), continued an ongoing effort to assess fish populations, compositions (hatchery/wild), and distributions, and habitat preferences in tributary streams of the Wenatchee, Entiat, and Methow River basins. Benefit: assessment of habitat and population trends in the rivers facilitates proper management decisions leading to the appropriate restoration actions on over one-hundred miles of tributary streams. These streams historically supported thousands of returning adult Chinook salmon and some still support tribal and sport fisheries. During 2006 we conducted summer Chinook and bull trout spawning surveys. We also neared completion of a report detailing results from a radio telemetry tracking study of Endangered Species Act listed bull trout populations in the Wenatchee River Basin. Benefit: study provides information on bull trout life history, distribution, habitat use, and migratory corridors. Data collected are an invaluable asset to development of bull trout management plan which will lead to the recovery of bull trout populations in the basin.

13330-A-105 - [Evaluation and management of hatchery mitigation programs at Leavenworth NFH Complex.](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Sampled the return of over 4,700 spring Chinook salmon to three federal hatcheries. Staff participated on the FWS Hatchery Review Team (Warm Springs NFH completed). Worked with state and tribal managers to collect and rear ESA-listed salmonids. Developed draft Comprehensive Hatchery Management Plans for all 3 hatchery facilities. Continued to provide ESA compliance support for the hatchery complex. Deployed temperature recorders throughout areas of Iccle Creek influenced by LNFH operations.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Effective hatchery practices produce fish for harvest, or for supplementation of wild populations, while minimizing deleterious effects on wild fish populations. Effective hatchery practices therefore are a critical component of salmon recovery in the Pacific Northwest.</p> <p>The problem:</p> <p>The US Bureau of Reclamation funds the hatchery evaluation programs associated with the Leavenworth National Fish Hatchery (LNFH) Complex (reimbursable; sub activity 1932 04BR). These programs are intended as partial mitigation for fish losses associated with Grand Coulee Dam.</p> <p>The objective:</p> <p>The Mid-Columbia River Fishery Resource Office (MCRFRO) evaluates the effectiveness of these programs and coordinates management of these stocks with other</p>							
Expended	\$549712								
Objective	Meet the Service's responsibilities for mitigating fisheries.								
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)								
Primary Benefited Population	Methow River (UCMET) spring chinook salmon.								
Plans	<p>Leavenworth Hatchery Genetics Management Plan</p> <p>Entiat Hatchery Genetics Management Plan</p> <p>Winthrop National Fish Hatchery Genetics Management Plan</p>								
Keyword	Management								
Need Number	N-002								
Partners									
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>4</td> </tr> <tr> <td>Number of Fishery Management Plan production tasks implemented (PART)</td> <td>4</td> </tr> <tr> <td>Number of post stocking survival tasks met as prescribed by Fishery Management Plans, for hatchery propagated depleted species (PART)</td> <td>1</td> </tr> <tr> <td>number of marking and tagging targets met,</td> <td>3</td> </tr> </table>			Number of population assessments completed	4	Number of Fishery Management Plan production tasks implemented (PART)	4	Number of post stocking survival tasks met as prescribed by Fishery Management Plans, for hatchery propagated depleted species (PART)	1	number of marking and tagging targets met,
Number of population assessments completed	4								
Number of Fishery Management Plan production tasks implemented (PART)	4								
Number of post stocking survival tasks met as prescribed by Fishery Management Plans, for hatchery propagated depleted species (PART)	1								
number of marking and tagging targets met,	3								

as prescribed by Fishery management plans. (PART)		<p>federal, state and tribal fish managers. The MCRFRO also provides ESA and NEPA compliance for the hatchery complex.</p> <p>The method:</p> <p>FY2006 activities include documenting returns to complex facilities, genetic tissue collection of all fish strains, assessment of production strategies and return rates, harvest estimates, determining impacts of hatchery production to natural stocks (including impacts to ESA listed species), fish marking, and coordination with co-managers.</p> <p>Further description:</p> <p>The US Bureau of Reclamation funds the hatchery evaluation programs associated with the Leavenworth National Fish Hatchery (LNFH) Complex. These programs are intended as partial mitigation for fish losses associated with Grand Coulee Dam. The Mid-Columbia River Fishery Resource Office (MCRFRO) evaluates the effectiveness of these programs and coordinates management of these stocks with other federal, state and tribal fish managers. MCRFRO's FY 2006 activities include providing ESA-compliance for the hatchery complex, documenting returns to each of the three facilities, genetic tissue collection of all fish strains, assessment of production strategies and their ability to return fish, harvest estimates, hatchery/wild fish disease assessments, maintenance of water temperature data loggers, determining impacts of hatchery production to natural stocks (including impacts to ESA-listed species), fish marking for study and management needs, and coordination with local and regional management entities and plans. We are also near completion of Comprehensive Hatchery Management Plans for all facilities. We completed Section 7 consultation for the operations and maintenance of Leavenworth</p>
Number of other Fishery Management Plan tasks implemented for populations of management concern.	2	
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	2	

	NFH.
--	------

13330-A-106 - [Partners for Fish and Wildlife -- Habitat Restoration](#)

Facility	Mid-columbia River Fisheries Resource Office
Expended	\$49511
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Methow River (UCMET) spring chinook salmon.
Plans	Bull Trout Draft Recovery Plan, Chapter 22 Methow Subbasin Plan
Keyword	Fish Passage
Need Number	N-002
Partners	Bonneville Power Administration Chewuch Basin Council U.S. Bureau of Reclamation Washington State Salmon Recovery Board

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	2
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1

Accomplishment Summary

This project will will improve limiting factors (stream habitat quantity, quality, and connectivity) for five federal and state listed salmonids and numerous native fish species.

Description

The importance to the Resource:

The Methow River Basin is a proposed focus area for the Partner's Program and Open Water (lakes, rivers, & streams) is a high priority habitat in this basin. Projects supported by this funding will improve limiting factors (stream habitat quantity, quality, and connectivity) for 5 federal and state listed salmonids and numerous native fish species.

The problem:

Limiting factors in the Methow River watershed include but are not limited to loss of habitat quantity, quality, and connectivity; and inadequate water quantity and quality. Threats include but are not limited to residential and agricultural development.

The objective:

The main objective for habitat restoration work will be to improve stream habitat quantity, quality, and connectivity under the confines of the current environment. Improvements will be secured for at least 10 years with landowner agreements.

The method:

Current and appropriate habitat restoration techniques for each site will be applied to accomplish objectives.

Further description:

In FY 2006 the Mid-Columbia River Fishery Resource Office (MCRFRO) established a Cooperative Agreement with the Methow Salmon Recovery Foundation (MSRF). Through this agreement we provided Partners (1121) funding to the MSRF for the purposes of: (1) helping to reverse the trend of declining fish and wildlife habitat by restoring such habitats on an ecosystem/watershed basis; and (2) promoting natural resource stewardship by actively cooperating in information and education programs and technical assistance on fish and wildlife habitat issues by implementing in-stream and riparian habitat restoration projects in the Methow River watershed. ESA listed spring Chinook salmon, steelhead, and bull trout along with other native fish species will benefit from in-stream and riparian restoration work in the Methow River watershed.

Additionally, MCRFRO has been actively participating on the technical team and assisting in writing portions of the Regional Step-down Plan for the Partner's for Fish and Wildlife Program for our geographic area.

13330-A-107 - [Mid-Columbia River Tributary Bull Trout Radio Telemetry and Thermal Regime Project](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>In coordination with Public Utility Districts (PUD's), Washington State, and FWS, University of Idaho, bull trout locations and movements were telemetry monitored in the Methow River Basin. Information will be used for management decisions leading to species recovery.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Resource managers are hampered by a lack of specific information necessary to make informed decisions reducing impacts to species and habitats. Similarly, specific locations utilized by bull trout in the Methow Basin had not previously been precisely identified diminishing sufficiency of management plans there.</p> <p>The problem:</p> <p>Information associated with bull trout seasonal distribution and spawning locations are lacking which hampers management leading to the eventual recovery of the bull trout.</p> <p>The objective:</p> <p>The object of this project is to describe the seasonal distribution and spawning locations of bull trout in the Methow River watershed. Information from this project will improve resource and aquatic species management plans leading to recovery and eventual de-listing of the species.</p> <p>The method:</p> <p>Bull trout in the Methow River were surgically</p>	
Expended	\$53341		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	Bull trout (Salvelinus confluentus)		
Primary Benefited Population	Methow River Bull Trout		
Plans	Bull Trout Draft Recovery Plan, Chapter 22 Methow Subbasin Plan		
Keyword	Monitoring and Assessment		
Need Number	N-002		
Partners	Chelan County Public Utility (\$50000) Douglas County Public Utility District (\$50000) U. S. Forest Service (\$10000) U.S. Bureau of Reclamation Washington Department of Fish and Wildlife (\$1000)		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments</td> <td>1</td> </tr> </table>			Number of population assessments
Number of population assessments	1		

completed		<p>implanted with radio tags, released, and will be tracked for up to three years to describe seasonal distribution. Telemetry data will be collected from fixed sites, mobile ground and air surveys.</p> <p>Further description:</p> <p>Current resource management plans, including water management operations by the Public Utility Districts and the Bureau of Reclamation in the Columbia River Basin are hampered by a lack of specific information necessary to make informed decisions reducing impacts to species and habitats. Similarly, specific locations utilized by bull trout in the Methow Basin had not previously been precisely identified diminishing sufficiency of management plans there. A bull trout radio telemetry monitoring project in the Methow basin was initiated in FY 2005. This project provides a continuance of an effort to describe bull trout movements throughout the middle and upper Columbia Basin. In addition to radio telemetry monitoring, MCRFRO also conducted bull trout spawning surveys in Goat Creek to assess population status, habitat conditions and recreational impacts. The MCRFRO, in coordination with Douglas County PUD, will continue to monitor adult bull trout populations in the Methow River basin.</p>
Number of other Recovery Plan tasks implemented for T&E populations	2	
Number of other Fishery Management Plan tasks implemented for populations of management concern.	3	

13330-A-108 - [Recovery planning and technical assistance to statewide aq/fish/water and local watershed groups](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Completed final draft Upper Columbia Salmon Recovery Plan and continued participation in watershed planning in the Upper Columbia River Ecoregion, Regional Technical Team and the Interior Columbia Basin Technical Review Coordination Group</p> <p>Description</p> <p>The importance to the Resource:</p> <p>MCRFRO participated in development and completion of the Draft Upper Columbia Spring Chinook, Steelhead and Bull Trout Recovery Plan and Implementation Schedule and provided technical assistance to a variety of federal, state, tribal and local aquatic resource groups including the FCRPS BiOp process, Wenatchee and Entiat Watershed Planning Units.</p> <p>The problem:</p> <p>Salmon and bull trout populations in the Pacific Northwest have declined to the point of being listed under the Endangered Species Act due to habitat degradation, over harvest, hatcheries, hydro-electric projects and introduction of non-native species.</p> <p>The objective:</p> <p>The objective is to recover spring Chinook, steelhead and bull trout through a variety of actions identified in the Upper Columbia Spring Chinook, Steelhead and Bull trout Recovery Plan and the Wenatchee and Entiat Watershed Plans.</p> <p>The method:</p>
Expended	\$155062	
Objective	Develop and improve long-term partnerships with States, Tribes, other Federal agencies, non-governmental organizations, and other Service Programs to develop collaborative conservation strategies for aquatic resources.	
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)	
Primary Benefited Population	Entiat River (UCENT-s) population, part of the Upper-Columbia River steelhead ESU.	
Plans	Federal Columbia River Power System 2002 Biological Opinion 2000 NMFS FCRPS Biological Opinion - December 21, 2000	
Keyword	Habitat	
Need Number	N-002	
Partners	Arapaho Tribe National Marine Fisheries Service Shoshone Tribe Washington Department of Fish and Wildlife Washington State Salmon Recovery Board Washington Department of Ecology	

Objectives will be met through the implementation of habitat restoration projects, modified hatchery programs and modified harvest and hydro activities. Most of this work is being completed in coordination with the FCRPS process.

Further description:

The MCRFRO participated in development and completion of the Draft Upper Columbia Spring Chinook, Steelhead and Bull Trout Recovery Plan (Plan) and Implementation Schedule. We increased our ability to provide technical assistance to federal, state, tribal and local aquatic resource groups including the FCRPS BiOp process, the Wenatchee Watershed Plan and Implementation of the Entiat Watershed Plan. These efforts increased the efficacy of restoration efforts leading toward recovery of ESA listed species. The MCRFRO assisted local groups in developing and securing funding for riparian and aquatic habitat restoration proposals. These activities support recovery efforts and communication between the USFWS, NOAA Fish, NRCS, BOR, BPA, ACOE, EPA, Yakama Nation, Colville Confederated Tribes, Washington State, county governments, local conservation districts and watershed groups. In addition, we participated in the numerous technical teams and the Washington State Salmon Recovery Funding Board. Finally, this project allowed the MCRFRO to participate in the review and comments on 50 restoration proposals requesting approximately \$15M from 4 different funding sources. A total of \$3M was allocated to the Upper Columbia Region in FY2006.

13330-A-109 - [Recovery of ESA-listed Entiat River Salmonids Through Improved Management Action](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Operated a juvenile salmonid trap throughout the year. Population and survival estimates were determined for spring and summer Chinook salmon. Data are now available real-time. This monitoring operation uses methods approved under BPA's Monitoring Strategy for the Upper Columbia Basin.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The effort will assist the recovery of ESA-listed spring Chinook salmon, steelhead and bull trout inhabiting the Entiat River Basin by gathering previously unknown information about the juvenile life history characteristics and populations of these species in this basin.</p> <p>The problem:</p> <p>The status of fish populations are largely unknown due to a lack of consistent monitoring. Funding for such monitoring programs is difficult to secure without partners.</p> <p>The objective:</p> <p>The MCRFRO will continue to monitor populations of fish, including ESA-listed species, produced in the Entiat River Basin. The effort assist recovery of ESA-listed spring Chinook salmon, steelhead and bull trout inhabiting the Entiat River Basin by gathering information about the juvenile life history characteristics and populations in this basin.</p> <p>The method:</p> <p>A rotray screw trap was operated throughout the year to capture migrating juvenile salmon</p>	
Expended	\$29695		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)		
Primary Benefited Population	Entiat River (UCENT) spring chinook salmon.		
Plans	Entiat Hatchery Genetics Management Plan Entiat Subbasin Plan		
Keyword	Monitoring and Assessment		
Need Number	N-002		
Partners	National Oceanic and Atmospheric Administration, Fisheries		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>1</td> </tr> </table>			Number of population assessments completed
Number of population assessments completed	1		

and steelhead and other fish following methods approved under BPA's Monitoring Strategy for the Upper Columbia Basin. A portion of captured fish were pit-tagged, generating travel time and survival estimates through the Columbia River corridor.

Further description:

MCRFRO continued the fourth year of an intensive and long term juvenile salmonid monitoring program. The effort will assist the recovery of ESA-listed spring Chinook salmon, steelhead and bull trout inhabiting the Entiat River Basin by gathering previously unknown information about the juvenile life history characteristics and populations of these species in this basin. This information will improve resource management decisions. A rotary screw trap operated nearly continuously, following methods approved under BPA's Monitoring Strategy for the Upper Columbia Basin, throughout the year and was highly successful in capturing a significant number and variety of species. All data is available in real-time and is disseminated widely. A portion of emigrating Chinook , steelhead and bull trout were pit-tagged, generating travel time and survival estimates through the Columbia River corridor. Tissue has been collected from Chinook and steelhead juveniles for genetic analysis. Some captured salmonids have been utilized to construct pathological profiles as part of the National Wild Fish Health Survey. Data collected this past year will be furthered compared to asses any potential impacts between hatchery versus the wild populations.

13330-A-110 - [Entiat River Basin Bull Trout Radio Telemetry Project](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>In FY 2006 we continued to monitor locations and movements of radio tagged adult bull trout in the Entiat River watershed. We also documented bull trout spawning, post-spawning, and over-wintering areas and identified barriers to migrations in the Mad and Entiat Rivers.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Resource managers are hampered by a lack of specific information necessary to make informed decisions reducing impacts to species and habitats. Similarly, specific locations utilized by bull trout in the Entiat Basin had not previously been precisely identified diminishing sufficiency of management plans there.</p> <p>The problem:</p> <p>Information associated with bull trout seasonal distribution and spawning locations are lacking which hampers management decisions leading to the eventual recovery of the bull trout.</p> <p>The objective:</p> <p>The object of this project is to describe the seasonal distribution and spawning locations of bull trout in the Entiat River watershed. Information from this project will improve resource and aquatic species management plans leading to recovery and eventual de-listing of the species.</p> <p>The method:</p> <p>Bull trout in the Entiat River were surgically implanted with radio tags, released, and were tracked to describe seasonal distribution and</p>			
Expended	\$43886				
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.				
Primary Benefited Species	Bull trout (Salvelinus confluentus)				
Primary Benefited Population	Entiat River Bull Trout.				
Plans	Bull Trout Draft Recovery Plan, Chapter 22 Entiat Subbasin Plan				
Keyword	Monitoring and Assessment				
Need Number	N-002				
Partners	Chelan County Public Utility (\$40000) Douglas County Public Utility District (\$40000) U. S. Forest Service (\$2000) Washington Department of Fish and Wildlife				
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>1</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>3</td> </tr> </table>			Number of population assessments completed	1	Number of other Recovery Plan tasks implemented for T&E populations
Number of population assessments completed	1				
Number of other Recovery Plan tasks implemented for T&E populations	3				

<p>Number of other Fishery Management Plan tasks implemented for populations of management concern.</p>	<p>1</p>	<p>spawning locations. Telemetry data were collected from fixed sites, mobile ground and air surveys. Data are shared with USFS, Mid-Columbia PUD's, WDFW, and USFWS Ecological Services.</p> <p>Further description:</p> <p>Bull trout are listed as threatened under the ESA. Current species and habitat plans are hampered by a lack of specific data regarding the identification of critical habitat, migrations and life history diversity of bull trout. This project initiated in FY 2003, is providing information on migrational corridors and barriers, rearing, spawning and over-wintering locations and genetic makeup of bull trout populations. This information will support designations of critical habitat areas for bull trout and provide information necessary to make better land use management decisions leading to recovery of the species within the Upper Columbia River Bull Trout Recovery Unit. In FY 2006 we continued to monitor movements and locations of bull trout throughout the Entiat Basin. We also conducted bull trout spawning ground surveys in the basin. We also identified migrations and movements into the mainstem Columbia River. Genetic information from tagged bull trout was collected and analyzed by Abernathy Fish Technology Center. This data, in combination with movement data, will provide information necessary to define populations and will be incorporated into the Upper Columbia River Basin bull trout genetic baseline database.</p>
---	----------	---

13330-A-111 - [From extirpation to colonization: an attempt to restore salmon back to their former streams](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>Monitoring and evaluations of adult salmon outplant continued in 2006. Surveys were conducted to determine adult chinook presence and distribution. A rotary screw trap was used to monitor Peshastin Creek juvenile salmon, steelhead and bull trout populations.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Depressed or exterpedated populations of salmon may be bolstered by using hatchery origin fish. Recovery of ESA-listed and non listed depressed or exterpedated populations may be facilitated by such programs.</p> <p>The problem:</p> <p>Native spring Chinook salmon have not been observed in Peshastin Creek since 1997. Obviously the native stock has been lost from the system. Habitat degradation and fish passage problems are believed to be the primary cause of the problem.</p> <p>The objective:</p> <p>The objective of this project was to determine if hatchery origin Chinook salmon could successfully reestablish a self reproducing population.</p> <p>The method:</p> <p>Spawning ground surveys in 2006 will document the ability of hatchery origin chinook salmon to rebuild a wild population without any further supplementation. We also continued to operate a rotray screw trap to monitor the juvenile fish population.</p>
Expended	\$12680	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Wenatchee River (UCWEN) spring chinook salmon	
Plans	<p>Wenatchee Subbasin Plan</p> <p>Conservation of Columbia Basin Fish, Final Basinwide Salmon Recovery Strategy, 12/2000 (All H Paper)</p> <p>Leavenworth Hatchery Genetics Management Plan</p>	
Keyword	Monitoring and Assessment	
Need Number	N-002	
Partners	<p>Bonneville Power Administration</p> <p>Chelan County Public Utility</p> <p>Leavenworth National Fish Hatchery</p> <p>Yakama Indian Nation</p>	
Accomplishments		

Number of population assessments completed	1	Further description:
Number of other Fishery Management Plan tasks implemented for populations of management concern.	2	
		<p>There is a lack of evidence regarding the ability of hatchery-origin salmon to spawn naturally and contribute to the restoration and recovery of wild populations. From 2001 to 2004, adult spring Chinook salmon of hatchery origin were released into Peshastin Creek. There has been no wild spring Chinook salmon in this creek in since 1997. These outplants of adult hatchery salmon provides an opportunity to assess the ability of naturally spawning hatchery fish to rebuild a wild population. Surveys confirmed that the hatchery salmon were successful in spawning and building a significant number of redds. Snorkeling surveys in 2002 through 2005 along with juvenile trapping in 2006 indicate that these redds were successful in producing juveniles but the quantity and long-term viability are unknown. This project is designed to answer these questions through quantitative trapping methodology to estimate population parameters, morphometrics, and genetic composition in comparison to the hatchery parentage and hatchery-reared cohorts. This long-term monitoring operation uses methods approved under BPA's Monitoring Strategy for the Upper Columbia Basin.</p>

13330-A-112 - [Entiat River Steelhead population assessment project.](#)

Facility	Mid-columbia River Fisheries Resource Office
Expended	\$25000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss .)
Primary Benefited Population	Entiat River (UCENT-s) population, part of the Upper-Columbia River steelhead ESU.
Plans	Entiat Subbasin Plan Federal Columbia River Power System 2002 Biological Opinion Entiat Hatchery Genetics Management Plan
Keyword	Monitoring and Assessment
Need Number	N-002
Partners	U. S. Forest Service (\$1000)

Accomplishments

Number of population assessments completed	2
Number of other Recovery Plan tasks implemented for T&E populations	1
Number of other Fishery Management Plan tasks implemented for populations of management concern.	2

Accomplishment Summary

Surveyed and documented ESA-listed steelhead spawning populations in the Entiat River Basin. We also captured and tagged juvenile steelhead to assess juvenile steelhead survival and migration timing through the Columbia River hydrosystem.

Description

The importance to the Resource:

Recovery of listed species is facilitated when resource managers have accurate and timely data regarding those populations.

The problem:

A lack of accurate data inhibits the resource management decision making process. Funding constraints have greatly limited the collection of abundance and productivity data.

The objective:

The objective of this project is to continue to collect and disseminate information regarding the abundance and productivity of ESA-listed steelhead populations in the Entiat River Basin.

The method:

In 2005 and 2006 we conducted weekly spawning ground surveys throughout the Entiat River Basin providing the first basin-wide assessment of steelhead population abundance. In addition, we captured and tagged over 1500 juvenile steelhead to assess survival through the Columbia River hydrosystem.

Further description:

	<p>The abundance of ESA-listed steelhead in the Entiat Basin was previously unknown. In 2005, the Mid-Columbia River FRO received funding through an agreement with NOAA-Fisheries to began a project to determine the natural productivity of the Entiat River basin steelhead population. Our focus on this project is due in part to the basin's importance as a reference stream for natural steelhead production in the Upper Columbia River steelhead ESU. These tagged fish will also provide for an evaluation of the smolt to adult survival upon the tagged fishes return to the Columbia River Basin. This is a multi-year funding agreement which will allow continuance of this survey work through at least FY 2007.</p>
--	--

13330-A-113 - [Implementation of the Upper Columbia Basin Effectiveness Monitoring Strategy in the Entiat River.](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We implemented the Upper Columbia Basin Effectiveness Monitoring Strategy in the Entiat River. Our role in this study is to evaluate the degree of benefit habitat restoration efforts have on the fish population by comparing pre and post fish utilization at restoration structures. During FY 2006 we conducted snorkel surveys at existing and proposed habitat modification sites within the mainstem Entiat River. We received 2-year extension (through FY 2007) contract with BPA for another \$100K.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>This project will ultimately help determine the most effective habitat restoration actions benefiting aquatic species. Therefore restoration monies are expended efficiently yielding maximum benefit to the resource greatly increasing the ability to recover depressed populations and maintain those healthier populations.</p> <p>The problem:</p> <p>The problem is that in many aquatic habitat restoration projects, long term monitoring to measure the effects of restoration efforts on aquatic life is not undertaken. The need to track the performance of habitat restoration efforts is paramount to improving restoration designs and ultimately improving aquatic habitat to recover ESA listed fish.</p> <p>The objective:</p> <p>The objective of this study is to monitor the fish habitat utilization of planned in-stream</p>			
Expended	\$40500				
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.				
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)				
Primary Benefited Population	Entiat River (UCENT) spring chinook salmon.				
Plans	Entiat Subbasin Plan				
Keyword	Monitoring and Assessment				
Need Number	N-002				
Partners	Chelan County Conservation District (\$10000) TerrAqua, Inc. (\$5000) U. S. Forest Service (\$1000)				
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>3</td> </tr> <tr> <td>Number of other Fishery Management Plan tasks implemented for populations of management concern.</td> <td>1</td> </tr> </table>			Number of population assessments completed	3	Number of other Fishery Management Plan tasks implemented for populations of management concern.
Number of population assessments completed	3				
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1				

restoration efforts in the Entiat River by conducting pre and post habitat construction snorkel surveys at selected control and treatment sites.

The *method*:

Fish were surveyed by direct observation using single-pass night-day snorkeling at 11 sites and three seasonal periods. Site locations were divided into proposed habitat structures (treatment sites), existing habitat structure sites, and non-modified locations (control sites). All fish observed were counted by species and assigned to size class.

Further description:

In 2005, the Chelan County Conservation District (CCCD) in association with the Entiat Watershed Planning Unit (EWPU), government agencies, and interest groups initiated a large scale restoration program in the Entiat River watershed, known as the "Entiat Bridge-to-Bridge Project." This is a phased program that will, over a several year period, incorporate a suite of stream restoration measures that include in-stream habitat structures, the reconnection of relict stream channels, and riparian plantings to address salmon habitat limiting factors. The restoration efforts in the Entiat River are intended to provide complexity to the river system and a positive benefit for aquatic organisms including ESA listed fish species.

The role of this study is to evaluate the degree of benefit habitat restoration efforts have on the fish population by comparing pre and post fish utilization at restoration structures. Additionally, information from this study will be used to improve future habitat restoration projects through an adaptive management strategy. This study will address the question of

	restoration accountability by providing information on the extent restoration efforts affect fish populations.
--	--

13330-A-114 - [Crab Creek In-stream and Riparian Habitat Restoration](#)

Facility	Mid-columbia River Fisheries Resource Office	<p>Accomplishment Summary</p> <p>In fiscal year 2006 a habitat survey was conducted and a restoration plan was completed. The Crab Creek Instream and Riparian Habitat Assessment and Restoration Plan will guide future actions necessary for the improvement of in-stream and riparian conditions on the Columbia National Wildlife Refuge Complex.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Crab Creek Instream and Riparian Habitat Assessment and Restoration Plan, completed in FY2006, will guide future actions to restore fish passage and enhance or restore riparian habitat conditions along a 14 mile stretch of Crab Creek located on NWR lands benefiting numerous aquatic and terrestrial species..</p> <p>The problem:</p> <p>A lack of funding and expertise precluded effective remedial actions to restore fish passage and enhance degraded habitat conditions on Crab Creek within the Columbia NWR.</p> <p>The objective:</p> <p>This project provided the funding necessary for a detailed survey of the stream and riparian habitat conditions on Crab Creek. Survey data was used to complete the restoration plan cited above. The restoration plan prioritized actions necessary to restore fish passage and enhance or restore riparian habitats.</p> <p>The method:</p> <p>A comprehensive survey was conducted and</p>	
Expended	\$44000		
Objective	Increase the quantity and improve the quality of aquatic and riparian habitat on Service lands.		
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)		
Primary Benefited Population	Not specified		
Plans	Crab Creek Subbasin Plan Crab Creek Instream and Riparian Habitat Assessment and Restoration Plan		
Keyword	Habitat		
Need Number	N-002		
Partners	Columbia National Wildlife Refuge Complex		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Fishery Management Plan tasks implemented for populations of management concern.</td> <td>3</td> </tr> </table>			Number of other Fishery Management Plan tasks implemented for populations of management concern.
Number of other Fishery Management Plan tasks implemented for populations of management concern.	3		

report finished.

Further description:

The Crab Creek In-Stream and Riparian Habitat Project is a cooperative effort between the Mid-Columbia Fishery Resource Office, Columbia National Wildlife Refuge Complex, Natural Resource Conservation Service, Othello Conservation District, Bureau of Reclamation, Ducks Unlimited and two landowners. The project area consists of 14 miles of in-stream and riparian habitat. The majority (12 miles) of property is on Service refuge lands. In fiscal year 2006 we completed phase 1 of the project. A consulting firm (BioAnalysts) was contracted and they surveyed 14 miles of Crab Creek. BioAnalysts then completed a restoration plan which addressed stream, riparian, and upland restoration needs throughout the project area. This is a three phase project. Phase 1 was completed in FY2006. Implementation will occur in phases 2 & 3. Species to be benefited from this project potentially include Chinook salmon, steelhead, native trout, waterfowl and neotropical song birds.

13295-A-009 - [Disease testing of adult spring Chinook salmon at Winthrop NFH](#)

Facility	Olympia Fish Health Center	<p>Accomplishment Summary</p> <p>Adult salmon were tested for pathogens to prevent disease and losses to production at Winthrop NFH</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Restoration and supplementation of Pacific salmon is essential to meet Service goals and obligations. Pathogens cause disease and losses of fish if not detected and controlled.</p> <p>The problem:</p> <p>Disease can cause significant losses to Winthrop NFH production and certain diseases can be transmitted from adults to progeny.</p> <p>The objective:</p> <p>Prevent and control pathogens and disease impacts to fish at Winthrop NFH</p> <p>The method:</p> <p>Scientifically based testing is performed to find any diseases that would be a threat to the population or would cause losses in production. 260 adult salmon were tested to determine the numbers of pathogens and threat of disease.</p> <p>Further description:</p> <p>Adult inspections are also necessary for any transfers of eggs.</p>
Expended	\$30000	
Objective	Utilize appropriate scientific and technologic tools in formulating and executing fishery management plans and policies.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Methow River (UCMET) spring chinook salmon.	
Plans	U.S. Fish and Wildlife Service National Aquatic Animal Health Policy Winthrop National Fish Hatchery Genetics Management Plan	
Keyword	Fish Health	
Need Number	N-002	
Partners	U.S. Bureau of Reclamation	

13245-A-013 - [Supplementation program and Otolith/ DNA Analysis for Summer Chum salmon](#)

Facility	Quilcene National Fish Hatchery	<p>Accomplishment Summary</p> <p>Provide funding to Washington Department of Fish & Wildlife to analyze otolith and DNA samples of summer chum salmon from Hood Canal and the Strait of Juan de Fuca. Information will be used to identify independent populations within the Hood Canal summer chum salmon ESU: migration(straying) understanding would be enhanced with better information. Provide funding for Big Beef supplementation program of summer chum salmon.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Hood Canal summer chum salmon were listed as threatened under the Endangered Species Act in 1999. In 2000, the Summer Chum salmon conservation initiative (SCSCI) was completed along with a formalized recovery plan. Monitoring and evaluation of the supplementation programs is an important component of the SCSCI.</p> <p>The problem:</p> <p>Summer chum fry from all supplementation and reintroduction programs have been differentially marked with adipose clips for Quilcene hatchery and program unique otolith marks for all other programs. Returning adult summer chum salmon otolith, scales, and tissue samples are taken from broodstock traps and on the spawning grounds. Analysis needed</p> <p>The objective:</p> <p>Examination of otoliths or fin clip ratios from spawned adults provide a method to estimate the number of hatchery origin and natural</p>
Expended	\$19898	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Chum salmon (Oncorhynchus keta)	
Primary Benefited Population	Hood Canal Summer Chum Salmon ESU/Big and Little Quilcene Rivers Population	
Plans	<p>Summer Chum Salmon Conservation Initiative</p> <p>Puget Sound and Coastal Washington Hatchery Reform Project</p> <p>Pacific Region Fisheries Outreach Action Plan</p>	
Keyword	Recovery	
Need Number	N-002	
Partners	<p>Hood Canal Salmon Enhancement Group</p> <p>North Olympic Salmon Coalition</p> <p>Port Gamble S'Klallam tribe</p> <p>Skokomish Tribe Washington</p> <p>Department of Fish and Wildlife (\$5000)</p>	

Accomplishments

Number of other Recovery Plan tasks implemented for T&E populations	1
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1

origin recruits. This analysis assists in determining the contribution of fry released and the level of straying of supplementation program origin fish to other drainages.

The method:

Provide funding to Washington Department of Fish & Wildlife to perform otolith and DNA analysis. See additional information below.

Further description:

Washington Department of Fish & Wildlife staff and other cooperators will collect, prepare and store the otolith and DNA samples and WDFW will prepare reports for and in-kind services value of \$5,000. Other partners will contribute in-kind services or funding. The amount may vary each year depending on available funding.

The first year funding will be for 2007. From 2008 on, the number of DNA samples will increase and the otolith samples will decrease. Again the amount that can be funded by the other partners is not accurately known through the projected 5 years. The best estimate is given in the funding section

Supplementation program will support the summer chum reintroduction program at Big Beef Creek by providing funds for temporary staff and partial operation of the remote hatchery facilities. Activities include (1) trapping and spawning of summer chum adults, (2) incubation of eggs, otolith marking of eyed eggs, and rearing and release of fed fry, and (3) paying for the costs of power and water associated with summer chum at the hatchery facilities

13320-A-009 - [Predation of Juvenile Chinook Salmon by Predatory Fishes in the Lake Washington system](#)

Facility	Western Washington Fisheries Resource Office
Expended	\$50000
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)
Primary Benefited Population	Puget Sound ESU/North Lake Washington Independent Population
Plans	Shared Strategy for Puget Sound and Recovery Plan, Draft
Keyword	Recovery
Need Number	N-002
Partners	Muckleshoot Indian Tribe National Oceanic and Atmospheric Administration, Fisheries

Accomplishments

Number of population assessments completed	1
Number of other Recovery Plan tasks implemented for T&E populations	1

Accomplishment Summary

We determined the level of predation of juvenile Chinook salmon by several species of predatory fishes in three areas of the Lake Washington system.

Description

The importance to the Resource:

Puget Sound Chinook salmon have recently been listed as threatened under the Endangered Species Act.

The problem:

Juvenile wild Chinook salmon occur in the Cedar River and Bear Creek. These juvenile fish must migrate through Lake Washington and the Ship Canal to reach the marine environment. Because the Lake Washington system is a highly altered system and is inhabited by several exotic species, losses to predation may be abnormally high.

The objective:

Our objective is to estimate how many juvenile Chinook salmon are lost to predation in the Lake Washington system.

The method:

In FY 2003, we collected over 300 stomach samples from predatory fishes in three main areas (Cedar River, south Lake Washington, and the Ship Canal) and submitted them to NOAA Fisheries for DNA analysis. A final report was completed in February 2004, and a manuscript was completed in FY 2006.

	<p>Further description:</p> <p>This work was originally funded by King County.</p>
--	---

13320-A-012 - [Habitat Use by Juvenile Chinook Salmon in Lake Washington and the Ship Canal](#)

Facility	Western Washington Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We documented the habitat requirements of juvenile Chinook salmon in the south end of Lake Washington as part of regional efforts to recover listed Lake Washington Chinook salmon.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The number of Chinook salmon in the Cedar River (a major tributary to Lake Washington) has declined to critically low numbers. This run is part of the listed Puget Sound Chinook salmon ESU.</p> <p>The problem:</p> <p>Large numbers of juvenile Chinook salmon emigrate to Lake Washington in February and March. Because juvenile Chinook salmon rarely inhabit lakes across their natural range, little is known about their basic ecology in lakes, including their habitat use.</p> <p>The objective:</p> <p>To better understand the habitat use and movement of Chinook while in Lake Washington.</p> <p>The method:</p> <p>We continued to assess habitat requirements of juvenile Chinook during the February-May period. We assessed their use of stormwater drains and habitat restoration sites. In May and June, 180 Chinook and 50 predators (bass and pikeminnow) were implanted with acoustic tags and their movements were monitored with six fixed hydrophone arrays.</p>			
Expended	\$325000				
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.				
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)				
Primary Benefited Population	Puget Sound ESU/Cedar River Independent Population				
Plans	Shared Strategy for Puget Sound and Recovery Plan, Draft				
Keyword	Recovery				
Need Number	N-002				
Partners	City of Seattle				
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of population assessments completed</td> <td>1</td> </tr> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> </table>			Number of population assessments completed	1	Number of other Recovery Plan tasks implemented for T&E populations
Number of population assessments completed	1				
Number of other Recovery Plan tasks implemented for T&E populations	1				

	<p>Further description:</p> <p>We also tagged 25 coho salmon to begin collecting information on their migratory behavior. The final report for 2003 and 2004 sampling was completed in FY 2006. This work was largely funded by the City of Seattle.</p>
--	---

13320-A-016 - [Elwha River Fishery Restoration](#)

Facility	Western Washington Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We assisted in completing the draft salmonid restoration plan for the Elwha River Fisheries and Ecosystem Restoration Project in FY 2006. The final plan will be published in FY 2007 as a NOAA technical document.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Elwha River Fisheries and Ecosystem Restoration Act of 1992 calls for removal of the Elwha River dams to achieve restoration of the Elwha River's ecosystem and native anadromous fisheries. Removal of the Elwha River dams will re-open 70 miles of pristine salmon habitat in Olympic National Park to 10 native fish stocks.</p> <p>The problem:</p> <p>Prior to removal of the Elwha River dams, a comprehensive and updated plan to restore the fish and fisheries of the river basin was needed.</p> <p>The objective:</p> <p>The plan is designed to secure appropriate broodstocks prior to dam removal (2002-2008), safeguard these stocks during the period of dam removal (2009-2010), restore these stocks, and monitor and manage the restoration project. The goal is to restore these stocks to harvestable levels throughout the watershed in the 10 years after dam removal.</p> <p>The method:</p> <p>We developed a plan to restore these stocks after dam removal. Due to changing funding and delays in starting the project, however, an</p>	
Expended	\$75000		
Objective	Facilitate management of aquatic habitats on national and regional scales.		
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)		
Primary Benefited Population	Puget Sound ESU/Elwha River Independent Population		
Plans	Elwha Ecosystem and Fishery Restoration Act of 1992 Shared Strategy for Puget Sound and Recovery Plan, Draft		
Keyword	Restoration		
Need Number	N-002		
Partners	Hatchery Scientific Review Group Lower Elwha Klallam Tribe National Oceanic and Atmospheric Administration, Fisheries Olympic National Park Washington Department of Fish and Wildlife		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks</td> <td>1</td> </tr> </table>			Number of other Recovery Plan tasks
Number of other Recovery Plan tasks	1		

Number of other Recovery Plan tasks implemented for T&E populations	1	amended EIS and updated fish restoration plan became necessary. The draft plan was completed in FY 2006 and the final plan will be published in FY 2007 as a NOAA technical document.
---	---	---

13320-A-018 - [Hatchery Reform Project](#)

Facility	Western Washington Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We continued to support the Western Washington Hatchery Reform Project by participating in multiple co-manager meetings on hatchery reform; monitoring Quilcene River summer chum salmon recovery by mark and scale sampling carcasses throughout the run; and by collecting northern Hood Canal coho salmon for DNA analysis in order to determine an appropriate Quilcene NFH coho brood stock.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>As part of the Endangered Species Act recovery process for several Puget Sound and coastal salmon and steelhead stocks, the State, Tribal and Federal managers of Washington's salmon and steelhead resources must ensure that their hatcheries do not present a risk to listed species.</p> <p>The problem:</p> <p>Hatcheries may cause adverse impacts to wild salmon through competition, predation, and interbreeding with wild cohorts.</p> <p>The objective:</p> <p>The hatchery reform process is intended to help recover naturally-spawning salmon, while providing sustainable fisheries. FWS hatcheries in western Washington were reviewed by the project's Hatchery Scientific Review Group, which developed a series of recommendations for FWS hatcheries to meet the objectives of hatchery reform.</p> <p>The method:</p>					
Expended	\$70016						
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.						
Primary Benefited Species	Coho salmon or silver salmon (Oncorhynchus kisutch)						
Primary Benefited Population	Not specified						
Plans	Shared Strategy for Puget Sound and Recovery Plan, Draft Puget Sound and Coastal Washington Hatchery Reform Project						
Keyword	Recovery						
Need Number	N-002						
Partners							
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> <tr> <td>Number of post stocking survival tasks met as prescribed by Fishery Management Plans, for hatchery propagated depleted species (PART)</td> <td>1</td> </tr> <tr> <td>Number of other Fishery Management Plan tasks implemented for populations of management concern.</td> <td>2</td> </tr> </table>			Number of other Recovery Plan tasks implemented for T&E populations	1	Number of post stocking survival tasks met as prescribed by Fishery Management Plans, for hatchery propagated depleted species (PART)	1	Number of other Fishery Management Plan tasks implemented for populations of management concern.
Number of other Recovery Plan tasks implemented for T&E populations	1						
Number of post stocking survival tasks met as prescribed by Fishery Management Plans, for hatchery propagated depleted species (PART)	1						
Number of other Fishery Management Plan tasks implemented for populations of management concern.	2						

	<p>The Western Washington Fish and Wildlife Office is specifically working to implement hatchery reforms recommendations for Quilcene, Quinault and Makah National Fish Hatcheries.</p>
--	---

13320-A-019 - [Cedar River Chinook Habitat Use: The Influence of Flow](#)

Facility	Western Washington Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We evaluated the influence of flow on habitat selection by juvenile Chinook salmon in the Cedar River at several spatial and temporal scales. Two chapters for the draft report were completed and submitted to cooperators for review.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Chinook salmon population in the Cedar River has declined to critically low number, and is part of the listed Puget Sound Chinook salmon ESU.</p> <p>The problem:</p> <p>This heavily managed system is a primary water source for the City of Seattle and surrounding areas and is also used to produce electrical power. A Habitat Conservation Plan was established with the City of Seattle for water management in this system.</p> <p>The objective:</p> <p>The plan listed several information needs, one of which was determining how flow influences habitat use and availability for juvenile Chinook salmon. The information collected will be incorporated into the Habitat Conservation Plan to improve flow management in this system for Chinook salmon restoration.</p> <p>The method:</p> <p>We collected habitat use data at several spatial scales in 2002-2004, which is being used to model habitat use by juvenile Chinook salmon. Data analysis occurred in FY 2004, FY 2005 and continued in FY 2006. Two chapters for</p>
Expended	\$125000	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)	
Primary Benefited Population	Puget Sound ESU/Cedar River Independent Population	
Plans	<p>Shared Strategy for Puget Sound and Recovery Plan, Draft</p> <p>Cedar River Watershed Habitat Conservation Plan</p>	
Keyword	Monitoring and Assessment	
Need Number	N-002	
Partners	<p>City of Seattle</p> <p>Muckleshoot Indian Tribe</p> <p>National Oceanic and Atmospheric Administration, Fisheries</p> <p>U.S. Army Corps of Engineers, Seattle District Washington</p> <p>Department of Ecology Washington</p> <p>Department of Fish and Wildlife</p>	

Accomplishments

Number of habitat assessments completed	3.0
Number of miles of in-stream habitat assessed	2.5
Number of miles of riparian habitat assessed	2.5
Number of population assessments completed	1
Number of other Recovery Plan tasks implemented for T&E populations	1
Number of other Fishery Management Plan tasks implemented for populations of management concern.	1

the draft report were completed in FY 2006. Final reporting will be completed in FY 2007.

Further description:

This work was initially funded in total by City of Seattle.

13320-A-020 - [Monitoring of Engineered Logjams in Western Washington](#)

Facility	Western Washington Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We monitored fish densities and distribution near engineered logjams in the North Fork Stillaguamish and Elwha Rivers, and fish distribution around natural logjams in the Quinalt and North Fork Stillaguamish Rivers.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Habitat restoration is seen as a means of restoring salmon populations and often includes adding woody debris to stream or river channels. Current knowledge of factors influencing fish densities in larger river channels is lacking, but limited data suggests that fish densities are greater at large woody debris structures that provide complex cover.</p> <p>The problem:</p> <p>Salmon populations throughout the Pacific Northwest have declined during the past two decades due to habitat degradation.</p> <p>The objective:</p> <p>The data collected will be used to determine if engineered logjams are an effective tool for restoring salmon in the Pacific Northwest.</p> <p>The method:</p> <p>We participated in a multi-agency team evaluating the influence of engineered logjams on river morphology and ecology. Data collection continued through FY 2006. Seasonal snorkel surveys were conducted to assess abundance at sites in the North Fork Stillaguamish River and Elwha River. A draft report was submitted to NOAA-Fisheries in FY 2006.</p>			
Expended	\$50000				
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.				
Primary Benefited Species	Chinook salmon or king salmon (Oncorhynchus tshawytscha)				
Primary Benefited Population	Puget Sound ESU/Skokomish River Independent Population				
Plans	Shared Strategy for Puget Sound and Recovery Plan, Draft				
Keyword	Restoration				
Need Number	N-002				
Partners	Lower Elwha Klallam Tribe National Oceanic and Atmospheric Administration, Fisheries Stillaguamish Tribe Washington State Fisheries Restoration Funding Board Washington Trout				
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of habitat assessments completed</td> <td>4.0</td> </tr> <tr> <td>Number of miles of in-stream habitat assessed</td> <td>6.0</td> </tr> </table>			Number of habitat assessments completed	4.0	Number of miles of in-stream habitat assessed
Number of habitat assessments completed	4.0				
Number of miles of in-stream habitat assessed	6.0				

Number of other Recovery Plan tasks implemented for T&E populations	1	<p>Further description:</p> <p>We assisted NOAA-Fisheries and Lower Elwha Tribal personnel in determining the influence of ELJ's on fish densities and distribution. We also evaluated the distribution of fish near ELJ's in the North Fork Stillaguamish River and around natural logjams in the Quinault River.</p>
---	---	---

13320-A-022 - [Pre-Dam-Removal Monitoring of Bull Trout in the Elwha River](#)

Facility	Western Washington Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We analyzed data on habitat use and food habits of bull trout, as part of pre-dam-removal monitoring studies in the Elwha River.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>The Elwha River dams are slated for removal in 2008 in order to restore salmon, steelhead, and searun char populations to the upper Elwha River basin. Understanding habitat requirements and population size of bull trout is important to determine the influence of removing two dams on this listed population.</p> <p>The problem:</p> <p>Baseline data on bull trout habitat requirements in the Elwha River basin were lacking.</p> <p>The objective:</p> <p>The data collected will be used to assess the impacts of dam removal on the abundance, habitat use, and food habits of Elwha bull trout. This information will allow adaptive management to occur to protect this population if short-term habitat conditions become detrimental to the population.</p> <p>The method:</p> <p>Snorkeling was used to determine bull trout abundance and evaluate habitat variables influencing the distribution and abundance of adult and sub-adult bull trout. Stomach samples were collected to determine bull trout diet in areas with and without anadromous fish passage.</p> <p>Further description:</p>
Expended	\$60000	
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.	
Primary Benefited Species	Bull trout (Salvelinus confluentus)	
Primary Benefited Population	Coastal-Puget Sound DPS - Olympic Peninsula Recovery Unit /Elwha River Core Area	
Plans	<p>Shared Strategy for Puget Sound and Recovery Plan, Draft</p> <p>Elwha Ecosystem and Fishery Restoration Act of 1992</p> <p>Draft Recovery Plan for the Coastal-Puget Sound Distinct Population Segment of Bull Trout, Volume II, Olympic Peninsula Management Unit.</p>	
Keyword	Monitoring and Assessment	
Need Number	N-002	
Partners	<p>Lower Elwha Klallam Tribe</p> <p>National Oceanic and Atmospheric Administration, Fisheries</p> <p>Olympic National Park</p>	
Accomplishments		

Number of habitat assessments completed	4.0	<p>We selected three study reaches in the Elwha River (one downstream of both dams, one in the reach between the two dams, and one upstream of both dams) that totaled 4.5 miles in length, and one reach in the Quinault River of 3 total miles in length. A report of findings will be prepared in FY 2007. Genetic samples were also collected to provide additional information regarding the relationship of the Elwha River bull trout to other local subpopulations, including the Quinault River bull trout. Data analysis continued in FY 2006.</p>
Number of miles of in-stream habitat assessed	9.0	
Number of miles of riparian habitat assessed	18.0	
Number of population assessments completed	4	
Number of other Recovery Plan tasks implemented for T&E populations	4	

13320-A-027 - [Hood Canal Summer Chum Salmon Recovery - Quilcene NFH Activities](#)

Facility	Western Washington Fisheries Resource Office	<p>Accomplishment Summary</p> <p>We monitored returns from hatchery supplementation and reported progress toward recovery for threatened summer chum salmon stocks in Hood Canal. We conducted stream surveys, age analysis, mark recovery, and related fishery management activities.</p> <p>Description</p> <p>The importance to the Resource:</p> <p>Populations of summer chum salmon in Hood Canal and the Strait of Juan de Fuca are listed as threatened under the Endangered Species Act.</p> <p>The problem:</p> <p>Overharvest, adverse hatchery interactions, and habitat loss are reasons for decline of Hood Canal summer chum salmon populations.</p> <p>The objective:</p> <p>Our participation in cooperative recovery activities will result in a recovered and delisted population within 20 years.</p> <p>The method:</p> <p>We contributed to development and implementation of recovery plans that addressed hatchery supplementation, re-introduction, harvest management, habitat conservation, and habitat restoration for Hood Canal summer chum salmon. We monitored returns from hatchery supplementation and reported progress toward recovery.</p>	
Expended	\$85000		
Objective	Recover fish and other aquatic resource populations protected under the Endangered Species Act.		
Primary Benefited Species	Chum salmon (Oncorhynchus keta)		
Primary Benefited Population	Hood Canal Summer Chum Salmon ESU/Big and Little Quilcene Rivers Population		
Plans	Summer Chum Salmon Conservation Initiative		
Keyword	Recovery		
Need Number	N-002		
Partners	National Oceanic and Atmospheric Administration, Fisheries Point No Point Treaty Tribes Quilcene National Fish Hatchery Washington Department of Fish and Wildlife		
<p>Accomplishments</p> <table border="1"> <tr> <td>Number of other Recovery Plan tasks implemented for T&E populations</td> <td>1</td> </tr> </table>			Number of other Recovery Plan tasks implemented for T&E populations
Number of other Recovery Plan tasks implemented for T&E populations	1		

13320-A-042 - [National Fish Passage Program - Glover Creek Culvert](#)

Facility	Western Washington Fisheries Resource Office
Expended	\$32200
Objective	Restore declining fish and other aquatic resource populations before they require listing under the Endangered Species Act.
Primary Benefited Species	Bull trout (Salvelinus confluentus)
Primary Benefited Population	Coastal-Puget Sound DPS - Puget Sound Recovery Unit /Snohomish-Skykomish Core Area
Plans	Shared Strategy for Puget Sound and Recovery Plan, Draft Draft Recovery Plan for the Coastal-Puget Sound Distinct Population Segment of Bull Trout, Volume I, Puget Sound Management Unit.
Keyword	Fish Passage
Need Number	N-002
Partners	Conservation District, Snohomish (\$25200)

Accomplishments

Number of instream miles enhanced	0.2
Number of riparian miles restored	0.8
Number of acres re-opened to fish passage	21
Number of miles re-opened to fish passage	1.2

Accomplishment Summary

Two undersized fish-blocking culverts will be removed and fish-passable culverts will be installed reopening 1.2 miles and 21 acres of stream and wetland habitat to coho salmon, bull and cutthroat trout. Large woody debris will be placed instream and a 35-foot riparian buffer will be planted along 0.8 miles of creek.

Description

The importance to the Resource:

Glover Creek is a tributary to the Pilchuck River and the Snohomish River. Glover Creek provides spawning and rearing habitat to coho salmon and cutthroat trout and foraging habitat for bull trout.

The problem:

Two undersized culverts blocked fish access to 1.2 miles of stream and 21 acres of wetland habitat. Past agricultural practices degraded the riparian zone and stream channel.

The objective:

Provide full fish access to the upstream habitat and restore the riparian zone and stream channel in the project area. The overall objective is increased salmonid usage and production from this tributary.

The method:

Two undersized fish blocking culverts were removed and a fish passable culvert and a concrete slab bridge were installed at the two locations. Both structures were designed according to Washington Department of Fish and Wildlife fish passage criteria. Wood was placed in the stream channel and trees and

Fish passage barriers removed or bypassed	2	shrubs were planted in the riparian zone.
Number of other Recovery Plan tasks implemented for T&E populations	2	

13265-A-003 - [Production and Distribution of Spring Chinook Salmon](#)

Facility	Winthrop National Fish Hatchery
Expended	\$0
Objective	Meet the Service's responsibilities for mitigating fisheries.
Primary Benefited Species	Chinook salmon or king salmon (<i>Oncorhynchus tshawytscha</i>)
Primary Benefited Population	Methow River (UCMET) spring chinook salmon.
Plans	Winthrop National Fish Hatchery Genetics Management Plan 2005-2007 Interim Management Agreement for Upriver Chinook, Sockeye, Steelhead, Coho, and White Sturgeon
Keyword	Mitigation
Need Number	N-002
Partners	U.S. Bureau of Reclamation (\$500000) Washington Department of Fish and Wildlife Yakama Indian Nation

Accomplishments

Number of Fishery Management Plan production tasks implemented (PART)	9
number of marking and tagging targets met, as prescribed by Fishery management plans.	4

Accomplishment Summary

Reared and released 484,000 yearling Spring Chinook Salmon into the Methow River (tributary to the Columbia River). Incubated to the fry stage and released 16,000 Spring Chinook salmon fry into the Methow River. Produced 784,000 Spring Chinook Salmon eggs from 499 returning adult salmon for use in Spring Chinook Salmon production and distribution at Winthrop NFH.

Description

The importance to the Resource:

The spring chinook program at Winthrop NFH was initiated as mitigation for construction of Grand Coulee Dam, however recently shifted to a recovery effort for the survival of spring chinook salmon in the upper Columbia Basin. Spring chinook in the upper Columbia Basin were listed by the National Marine Fisheries Service as "endangered" in 1999.

The problem:

Indigenous spring chinook salmon numbers have been on a gradual downward trend since the construction of several hydroelectric projects on the upper Columbia River. Reasons for decline include the construction and operation of mainstem Columbia River hydropower projects, habitat degradation, harvest management and hatchery practices.

The objective:

The objective is to assist in rebuilding the naturally spawning spring chinook salmon populations in the Methow River, tributary to the Columbia River. In addition, the program is designed to provide sport and tribal harvest opportunities during years when escapement

(PART)		goals are exceeded.
Number of other Fishery Management Plan tasks implemented for populations of management concern.	3	The method:
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	7	Local spring chinook salmon collected from the Methow River (upper Columbia River ESU) are used as broodstock. The Winthrop NFH provides refugia, incubation, rearing, marking, acclimation, and release of spring chinook salmon to the Methow River system.
		Further description:
		The Winthrop National Fish Hatchery is located near the Methow River in North Central Washington State. Returning adults must pass nine dams to reach the Winthrop hatchery. Salmon are reared and released as mitigation for construction of Grand Coulee Dam. The Winthrop National Fish Hatchery raises Salmon in accordance with the Columbia River Fisheries Management Plan. Benefits of the Winthrop stocking program include maintaining returns of Spring Chinook Salmon to the upper Columbia, and Methow Rivers. The Winthrop National Fish Hatchery is one of three hatcheries in the Leavenworth National Fish Hatchery Complex. The Complex was authorized by the Grand Coulee Fish Maintenance Project, April 3, 1937, and reauthorized by the Mitchell Act, May 11, 1938. Currently, the Complex is funded through a reimbursable agreement (sub activity 1932) with the Bureau of Reclamation as mitigation for Grand Coulee Dam, and is authorized by the US v. Oregon decision, and the US Canada Treaty.

13265-A-004 - [Rearing and release of Summer Steelhead for recovery and restoration of species](#)

Facility	Winthrop National Fish Hatchery
Expended	\$0
Objective	Meet the Service's responsibilities for mitigating fisheries.
Primary Benefited Species	Rainbow trout (Oncorhynchus mykiss)
Primary Benefited Population	Methow River (UCMET-s) population, part of the Upper-Columbia River steelhead ESU.
Plans	Winthrop Hatchery Genetics Management Plan (Steelhead) 2005-2007 Interim Management Agreement for Upriver Chinook, Sockeye, Steelhead, Coho, and White Sturgeon
Keyword	Mitigation
Need Number	N-002
Partners	U.S. Bureau of Reclamation (\$90000) Washington Department of Fish and Wildlife

Accomplishments

Number of Fishery Management Plan production tasks implemented (PART)	5
number of marking and tagging targets met, as prescribed by Fishery management plans.	3

Accomplishment Summary

Reared and released 103,000 yearling Summer Steelhead into the Methow River (tributary to the Columbia River).

Description

The importance to the Resource:

The steelhead program at Winthrop National Fish Hatchery is part of the recovery effort for the survival of summer steelhead in the upper reaches of the Columbia River. Steelhead in the upper Columbia were listed by the National Marine Fisheries Service as "endangered" in 1997 and reduced to "threatened" status in 2005.

The problem:

Indigenous summer steelhead numbers have been on a gradual downward trend since the construction of several hydroelectric projects on the upper Columbia River. Reasons for decline include the construction and operation of mainstem Columbia River hydropower projects, habitat degradation, release locations, and hatchery practices.

The objective:

The objective is to assist the Washington Department of Fish and Wildlife in rebuilding the naturally spawning summer steelhead populations in the Methow River, tributary to the Columbia River. In addition, the program is designed to provide sport and tribal harvest opportunities during years when escapement goals are exceeded.

The method:

(PART)		Wells Stock (Upper Columbia ESU) summer steelhead are transferred to Winthrop NFH as eyed eggs in February of each year. The Winthrop NFH provides incubation, rearing, marking, acclimation, and release of yearling steelhead to the Methow River system.
Number of other Fishery Management Plan tasks implemented for populations of management concern.	2	
Number of applied science and technology tasks implemented as prescribed by Fishery Management Plans. (PART)	7	Further description: A total of 103,000 yearling Summer Steelhead were reared at the Winthrop National Fish Hatchery, and released into the Columbia River Basin. The steelhead are tagged and marked to evaluate the success of recovery efforts. The Winthrop National Fish Hatchery raises steelhead in accordance with the Columbia River Fisheries Management Plan, and National Marine Fisheries Service guidelines. The Winthrop National Fish Hatchery is one of three hatcheries in the Leavenworth National Fish Hatchery Complex. The Complex was authorized by the Grand Coulee Fish Maintenance Project, April 3, 1937, and reauthorized by the Mitchell Act, May 11, 1938. Currently, the Complex is funded through a reimbursable agreement (sub activity 1932) with the Bureau of Reclamation as mitigation for Grand Coulee Dam, and is authorized by the US v. Oregon decision, and the US Canada Treaty.