Resident Fish Committee

Columbia Basin Fish and Wildlife Authority

Quarterly Project Implementation Review

Resident Fish Committee of the Columbia Basin Fish and Wildlife Authority First Quarterly Program Implementation Review

March 12-13, 2003
Sunriver, Oregon

Review Program

Wednesday	**March 12**

Session 1: Bull Trout Monitoring and Evaluation

5:15 – 5:30 p.m.	Review Overview
5:30 – 6:30	Project 200200600: Evaluate Bull Trout Movements in the Tucannon and Lower Snake Rivers; *Mike Faler, U.S. Fish and Wildlife Service*

Thursday	**March 13**

Session 1 - Continued: Bull Trout Monitoring and Evaluation

8:30-8:45 a.m.	Review Overview
8:45-9:30	Project 199405300: Bull Trout Assessment - Willamette/ McKenzie; *Jeffrey Ziller, Oregon Department of Fish and Wildlife*
9:30 – 10:30	Project 199405400: The Population Structure of Bull Trout in the John Day River and Abundance of Bull Trout in Mill Creek/Characterize the Migratory Patterns, Population Structure, Food Habits, Abundance of Bull Trout from Subbasins in the Blue Mountains*; Al Hemmingsen, Oregon Department of Fish and Wildlife*
10:30-10:45	**Break**
10:45 -11:45	Project 199405400: The Population Structure of Bull Trout in the John Day River and Abundance of Bull Trout in Mill Creek/Characterize the Migratory Patterns, Population Structure, Food Habits, Abundance of Bull Trout from Subbasins in the Blue Mountains*; Chris Brun Confederated Tribes of the Warm Springs Reservation*
11:45 – 1:00 p.m.	**Lunch (working lunch for ad hoc RFC Charter Workgroup)**
1:00 -2:00	Project 199701900: Evaluate the Life History of Native Salmonids in the Malheur Basin; *Lawrence Schwabe, Burns Paiute Tribe*

Session 2: Monitoring and Evaluation- The Other Resident Fishes

2:00 -3:00 p.m.	Project 198605000: White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers; *Dave Ward, Oregon Department of Fish and Wildlife*
3:00 – 3:30	Project 25093: Characterize Genetic Differences and Distribution of Freshwater Mussels; *David Close, Confederated Tribes of the Umatilla Indian Reservation*

3:30 -3:45	Concluding comments and identification of dates and locations for the Second and Third Quarterly Project Implementation Reviews
3:45	**Meeting Adjourns**

Abstracts and Background of Projects

In alphabetical order by author's last name

Project 199405400: The Population Structure of Bull Trout in the John Day River and Abundance of Bull Trout in Mill Creek/Characterize the Migratory Patterns, Population Structure, Food Habits, Abundance of Bull Trout from Subbasins in the Blue Mountains

Chris Brun, Confederated Tribes of the Warm Springs Reservation

The range of bull trout (*Salvelinus confluentus*) in the Deschutes River basin has decreased from historic levels due to many factors including dam construction, habitat degradation, brook trout introduction and eradication efforts. While the bull trout population appears to be healthy in the Metolius River-Lake Billy Chinook system they have been largely extirpated from the upper Deschutes River (Buchanan et al. 1997). Little was known about bull trout in the lower Deschutes basin until BPA funded project #9405400 began during 1998. In this progress report we describe the findings to date from this multi-year study aimed at determining the life history, habitat needs and limiting factors of bull trout in the lower Deschutes subbasin.

Juvenile bull trout and brook trout (*Salvelinus fontinalis*) relative abundance has been assessed in the Warm Springs River and Shitike Creek since 1999. In the Warm Springs R. the relative densities of juvenile bull trout and brook trout were .003 fish/m^2 and .001 fish/m^2 respectively during 2002. These densities were the lowest recorded in the Warm Springs River during the period of study. In Shitike Cr. the relative densities of juvenile bull trout and brook trout were .025 fish/m^2 and .01 fish/m^2 respectively during 2002.

The utility of using index reaches to monitor trends in juvenile bull trout and brook trout relative abundance in the Warm Springs R. has been assessed since 1999. During 2002 the mean relative densities of juvenile bull trout within the 2.4 km study area was higher than what was observed in four index reaches. However, the mean relative densities of brook trout was slightly higher in the index reaches than what was observed in the 2.4 km study area.

Habitat use by both juvenile bull trout and brook trout was determined in the Warm Springs R. Juvenile bull trout and brook trout were most abundant in pools and glides. However pools and glides comprised less than 20% of the available habitat in the study area during 2002.

Multiple-pass spawning ground surveys were conducted during late August through October in the Warm Springs R. and Shitike Cr. during 2002. One-hundred and thirteen (113) redds were enumerated in the Warm Springs R. and 204 redds were found in Shitike Cr. The number of redds enumerated in both the Warm Springs R. and Shitike Cr. were the most redds observed since surveys began in 1998. Spatial and temporal distribution in spawning within the Warm Springs R. and Shitike Cr. is discussed.

Juvenile emigration has been monitored in Shitike Creek since 1996. A total of 312 juveniles were estimated to have emigrated from Shitike Cr. during the spring, 2002. Adult escapement

was monitored in the Warm Springs R. and Shitike Cr. Thirty adults were recorded at the Warm Springs National Fish Hatchery weir during 2002. This was the highest number of spawning adults recorded to date. A weir equipped with an underwater video camera near the spawning grounds was operated in the Warm Springs R. Thirty-one adults were recorded at the weir in day counts. The adult trap in Shitike Cr. was unsuccessful in capturing adult bull trout during 2002 due to damage from a spring high water event.

Thermographs were placed throughout Warm Springs R. and Shitike Cr. to monitor water temperatures during bull trout migration, holding and spawning/rearing periods. During 1999-2002 water temperatures ranged from 11.8-15.4° C near the mouths during adult migration; 11.4-14.6 ° C during pre-spawning holding; and 6.5-8.4° C during adult spawning and juvenile rearing.

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Additional Documents:

199405401 Narrative (MS Word, 61 kb)

Reviews and recommendations

Section 1. General administrative information

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Manager of program authorizing this project Patty O'Toole

Province Columbia Plateau **Subbasin** Deschutes

Short description
Methods for monitoring juvenile and adult abundance will be evaluated to determine accurate and cost effective means of assessing the recovery of bull trout populations in the lower Deschutes River.

Target species
Bull Trout

Project Location

Latitude	Longitude	Description
+/- 44 41 39.55	121 13.47 71	Deschutes River at Rkm 161.
+/- 44 51 29.79	121 04 0.62	Mouth of Warm Springs River at Deschutes R. Rkm 135
+/- 44 45 43.61	121 13 40.87	Mouth of Shitike Creek at Deschutes R. Rkm 151

Section 2. Past accomplishments

1995	Ongoing. Recorded the number of adult immigrants to the Warm Springs R. at the Warm Springs National Fish Hatchery.
1996	Ongoing. Monitored juvenile bull trout emmigrants from Warm Springs R. and Shitike Cr.
1996	Ongoing. Participated in bull trout working groups in the Deschutes and Hood R. subbasins
1996	Determine genetic composition of bull trout in Warm Springs R. and Shitike Cr.
1998	Indentified and mapped juvenile bull trout distribution within the Warm Springs Reservation, Oregon.
1998	Identified and mapped bull trout spawning distribution within the Warm Springs Reservation, Oregon.
1998	Ongoing. Monitored water temperatures in Warm Springs R., Shitike Cr. and Whitewater R.
1999	Indentified movement patterns, using radio telemetry, of adult bull trout in the lower Deschutes R., Warm Springs R, and Shitike Cr.
1999	Ongoing. Participated in bull trout recovery planning in the Deschutes and Hood R. recovery unit chapters.
1999	Ongoing. Conducted juvenile relative abundance monitoring in Warm Springs R. and Shitike Cr.
1998	Ongoing. Conducted basin-wide bull trout redd surveys in Warm Springs R., Shitike Cr. and Whitewater R.
2000	Indentified movement patterns, using radio telemetry, of adult bull trout in the lower Deschutes R., Warm Springs R, and Shitike Cr.
2000	Determined length at age by scale analysis of bull trout in the lower Deschutes R., Warm Springs R. and Shitike Cr.
2000	Field tested the AFS interim protocol to determine juvenile bull trout presence in Mill Cr.
2000	Determined if bull X brook trout hybrids were present in Warm Springs R. and Shitike Cr.

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2001	Conducted winter juvenile bull trout distribution surveys in Warm Springs R. and Shitike Cr.

Section 3. Relationships to other projects

Project #	Title/description	Nature of relationship
9405400	Bull Trout Genetics, Habitat Needs, L.H. Etc. In Central And N.E. Oregon	sub-contractor with ODFW for work in the lower Deschutes subbasin.

Section 4. Objectives

Task-based budget

Objective	Task	Duration in FYs	Estimated FY 2002 cost	Subcontractor
1. Monitor trends in relative abundance of juvenile bull trout (Age I-III) in the Deschutes subbasin.	a. Assess the utility of using "index" reaches for monitoring trends in juvenile bull trout relative abundance in the Warm Springs River	Ongoing	10,000	
	b. Conduct juvenile bull trout abundance surveys in Shitike Creek	Ongoing	10,000	
2. Determine the sampling efficiency of night snorkeling by comparing day and night snorkeling to electrofishing.	a. Compare the probability of detecting bull trout using day snorkeling, night snorkeling, electrofishing to an unbiased estimate of the true population.	1	20,000	
	b. Describe the influence of physical channel features including stream size, water temperature, conductivity, channel complexity, and abundance of cover on probabilities of detecting bull trout.	1	20,000	

3. Monitor trends in adult bull trout abundance using redd surveys in Warm Springs River and Shitike Creek.	a. Count the total number of bull trout redds in both streams.	ongoing	8,000	
	b. Determine if there is a significant difference between years in the distribution of redds within each stream.	Ongoing	8,000	
	c. Determine if there is a significant difference among years in the timing of spawning.	Ongoing	7,000	
4. Determine escapement of adult fluvial bull trout in the Warm Springs River and Shitike Creek.	a. Estimate the number of adult fluvial bull trout entering the spawning grounds in Warm Springs R. using time-lapse underwater videography.	5	35,000	
	b. Estimate the number of adult fluvial bull trout entering Shitike Cr. using a weir and fish trap.	5	15,000	
	c. Determine the adult per redd ratio in Shitike Cr. and Warm Springs R. and estimate the abundance of spawners from redd counts.	5	4,000	
		Total	137,000	

Reviews and recommendations

This information was not provided on the original proposals, but was generated during the review processes.

ISRP Preliminary Review, ISRP 2001-6	**ISRP Recommendation:** Fundable only if response is adequate	**Date:** 6/15/2001	**Rec$:** N/A
Comment: Fundable if adequate responses are given to ISRP concerns. The stated objective is to test night snorkeling efficacy versus day snorkeling or electrofishing is likely not necessary.			

Night snorkeling is generally recognized as an efficient method for detecting bull trout. There may be logistical reasons to explore to the relationship between detections based on day snorkeling and day electrofishing, however the proposal could have described this need more compellingly. Thus, the need for tasks associated with this objective need to be better justified tosupport funding. For the purposes of management of bull trout in the Deschutes basin, it is doubtful that the precision generated by the methods comparison is necessary. Relative abundance and trend data probably give sufficient resolution for most management level questions. The proposal implies that part of the rationale for the comparison of sampling methods is the inclusion of the Deschutes data into a larger regional bull trout dataset being assembled by Russ Thurow and colleagues at the USFS Rocky Mountain Experiment Station in Boise. The presentation amplified this relationship. The proposal needs to provide additional documentation on the linkage to the USFS regional protocol and the involvement of Thurow et al., even if no funding is allocated to the Boise station. Study reaches need to be selected in cooperation with Projects #25088 and #25010. Use of index reaches (Objective 1 and 3) or survey of known spawning ground surveys (Objective 3) have proven to be unacceptable in most fisheries monitoring and evaluation programs, e.g., the Oregon Coastal Coho surveys where they have been replaced by probabilistic sampling procedures developed by the EPA\EMP program. Selection of long-term sampling reaches for this project should be selected in cooperation with Projects #25088 and #25010. “Index sites” could be used for development of subsampling procedures, but they should be part of a systematic sample of collocated sites if possible.

Sponsor Response to the ISRP's Preliminary Comments: N/A

CBFWA Review Comments	**CBFWA Recommendation:** High Priority	**Date:** 8/3/2001	**Rec$:**0

Comment:

The activities in this proposal are now Objectives 3, 6, 7, and 8 in ODFW's Project Number 199405400. In previous years, these objectives were included in ODFW's 199405400.

ISRP Final Review, ISRP 2001-8	**ISRP Recommendation:** Fund	**Date:** 8/8/2001	**Rec$:** N/A

Comment:

Fundable. Adequate response. It is encouraging to note that the Oregon interagency monitoring committee (see response to ISRP from 199801600) has this project under its purview because it is important that long-term sampling sites for this project be selected in cooperation with other projects (#s 25088, 25010, 199801600). “Index sites” may be appropriate but the methods of data collection at them should be compatible with those of basin-wide monitoring programs so that inferences can be drawn about changes observed in the subbasin in the context of changes occurring in the larger region. (high priority)

BPA Review Comment: N/A

NWPPC Funding		**Date:**	**Rec$:** 0

Recommendation	Not Fund	11/2/2001	
Comment:			
BPA Funding Decision	**BPA Funding Decision:** Do Not Fund	**Date:** 3/6/2002	**Rec$:** 0
Comment:			

Project 25093: Characterize Genetic Differences and Distribution of Freshwater Mussels

David Close, Confederated Tribes of the Umatilla Reservation

The purpose of this study is to provide the critical information on the status of freshwater shellfish—especially the western pearlshell mussel, *Margaratifera falcata*—that is called for in the Umatilla Subbasin Summary. This information is essential for restoration of freshwater mussels and associated traditional and cultural uses. Freshwater mussels were vital components of intact salmonid ecosystems that have been affected directly and indirectly by dams, habitat deterioration, and decline in salmon; they are culturally important to Native Americans; and little is known about their distribution, status, and population structure to guide recovery actions. The project has three objectives: 1) to survey the distribution and status of freshwater mussels in the Umatilla River, where they may be extinct, and the Middle Fork John Day River, where they may remain using the first stage of two-stage adaptive cluster sampling; 2) to determine macro and microhabitat factors that control distribution and abundance; and 3) to test whether genetic population structure exists in *M. falcata* by examining five aggregations in the Columbia River and an outgroup using microsatellite DNA variation. Both these objectives provide information that will be useful for restoration efforts elsewhere in the Basin.

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Additional Documents:

25093 Narrative (MS Word, 172 kb)
25093 Sponsor Response to the ISRP (MS Word, 28 kb)

Reviews and recommendations

Section 1. General administrative information

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Manager of program authorizing this project Gary James

Province Columbia Plateau **Subbasin** Umatilla

Short description
Conduct freshwater mussel surveys to assess their status and test for geographical genetic differences among the western pearlshell mussel, Margaritifera falcata.

Target species
Freshwater Mussels

Project Location

Latitude	Longitude	Description
45 55 +/-	119 17 +/-	Project ranges from the mouth of the Umatilla River to Headwaters
45 45 +/-	118 00 +/-	Headwaters of the Umatilla River Basin to the East
45 15 +/-	118 50 +/-	Headwaters of the Umatilla River Basin to the South
45 10 +/-	119 15 +/-	Headwaters of the Umatilla River Basin to the West
		Entire Middle Fork John Day Basin
44 54 +/-	119 18 +/-	Middle Fork John Day River at Mouth
44 35 +/-	118 26 +/-	Middle Fork John Day River at Phipps Meadows

Section 2. Past accomplishments

	N/A New Project

Section 3. Relationships to other projects

Project #	Title/description	Nature of relationship
9000501	Umatilla Basin Natural Production Monitoring and Evaluation	This project is part of the overall goal to recover an intact, fully functioning, salmonid producing river in the Umatilla River. The CTUIR has numerous projects focusing on recovery of the Umatilla River Basin for salmonids and other species, such as
8373600	Umatilla Passage Facility Operations and Maintenance	Pacific lampreys. The restoration project for the Pacific lampreys has the closest relationship to this project, because both focus on restoration of species that require healthly salmon populations for their persistence.
8802200	Umatilla Fish Passage Operations	
9506000	Pacific Lamprey Research and Restoration	
8710001	Umatilla Fish Habitat Enhancement	

Section 4. Objectives

Task-based budget

Objective	Task	Duration in FYs	Estimated FY 2002 cost	Subcontractor
1. Assess the status of freshwater mussels in the Umatilla and Middle Fork John Day rivers	a. Determine sampling locations.	1	8,000	
1.	b. Conduct mussel surveys	5	203,977	
1.	c. Analyze data	3	5,000	
2. Test for genetic differences	a. Collect samples	3	5,000	

2.	b. Develop microsatellite DNA primers ($2500/primer x 8 primers)	3	24,700	X
2.	c. Characterize microsatellite DNA genotypes ($50/fish x 60 fish/samples x 6 samples)	6	22,230	X
2.	d. Develop mitochondial DNA primers		20,000	X
2.	e. Characterize mitochondial DNA variation		15,000	X
2.	f. Analyze results (0.05 FTE)	2	3,000	
3. Complete final report to funding agency	a. Write final report (0.05 FTE)	2	3,000	
4. Publish results in scientific journal	a. Submit manuscript for review (page charges @ $100/page + reprints)	1	2,000	
		Total	311,907	

Out year objective-based budget

Objective	Starting FY	Ending FY	Estimated cost
1. Assess the status of freshwater mussels in the Umatilla and Middle Fork John Day rivers	2003	2006	867,908
2. Test for genetic differences	2003	2003	86,930
3. Complete final report to funding agency	2003	2006	24,000
4. Publish results in scientific journal	2003	2006	8,000

Reviews and recommendations

This information was not provided on the original proposals, but was generated during the review processes.

ISRP Preliminary Review, ISRP 2001-6	**ISRP Recommendation:** Fundable only if response is adequate	**Date:** 6/15/2001	**Rec$:** N/A

Comment:

Fundable if adequate responses are given to ISRP concerns. They should discuss focusing goals and objectives on practical applications. What are the limiting factors on mussels? Food supply? What life history stage is limited? How might abundance be increased?

The proposal was well-prepared and well-presented. PI's look very qualified for the type of work proposed. Objectives are straightforward, well-described as are the associated tasks. Good linkages to regional planning documents, FWP, and to general ecosystem principles. While these are commendable in an academic sort of approach to obtaining basic information about mussels, information which might have importance in management decisions, the primary goal of the project to restore harvestable populations of mussels should not be obscured. It would be well to enlarge upon the tasks, and evaluation of results that relate directly to this goal.

One of the attractive aspects of the proposal is the planned genetics work at the regional level, which will survey genetic variation among mussel populations throughout the Columbia River basin. We note that one possible outcome, as discussed in the text (p. 4), is that the populations will be found to be undifferentiated. A survey at this scale (as is also proposed for Pacific lamprey) will likely provide important information that will bear on decisions about management units, reintroduction efforts, supplementation efforts (if they are initiated), and population structure.

Sponsor Response to the ISRP's Preliminary Review		**Date:**6/29/2001	
CBFWA Review Comments	**CBFWA Recommendation:** High Priority	**Date:** 8/3/2001	**Rec$:**0

Comment:

Historically, freshwater mussels were an important subsistence species for the CTUIR. However, mussel populations have declined and as a result mussels can no longer be used for purposes of subsistence. Mussels have been listed as candidate species in the Willamette River. However, little, if anything, is known about freshwater mussel distribution, abundance and habitat quality east of the Cascades. The ODFW suggests that there is a need to initiate this type of work. The reviewers recommend that preliminary genetic analyses should be limited to mtDNA (RFLPs) analyses. Microsatellite analyses should only be used if mtDNA data are not conclusive.

ISRP Final Review, ISRP 2001-8	**ISRP Recommendation:** Fund	**Date:** 8/8/2001	**Rec$:** N/A

Comment:

Fundable in part to do the distribution work. The response was too brief and addressed the ISRP concerns superficially. The reviewers were not convinced that this was the right approach to addressing mussel issues. The reviewers recommend that the distribution work be done with a solid experimental design testing several hypotheses including fish presence, sedimentation, habitat degradation, and overexploitation. The genetic work, while well-designed and appropriate to test whether one or multiple populations exist,

can be conducted at a later date after the distribution and ecological hypothesis testing are complete. Because of the expected low abundance of mussels, however, tissue samples should be collected throughout the study as populations are encountered. The proposed study, while thorough, seems to be one of relatively high-cost asking for nearly $2 million over its proposed 5-year duration. It is worth asking if the major objectives of the study can be achieved with a lesser amount and a shorter study duration?
BPA Review Comment: N/A

NWPPC Funding Recommendation	**NWPPC Recommendation:** Fund	**Date:** 11/2/2001	**Rec$:** 220,000

Comment:

Characterize genetic differences and distribution of freshwater mussels, Project 25093

ISRP provided a Fund In Part recommendation for the distribution work submitted in Proposal 25093. CBFWA rated the entire project as High Priority. Thus, the Council has a consensus recommendation for the distribution portion of the proposal.

Staff Recommendation: Freshwater mussels were an important subsistence species for the CTUIR. Given the cultural significance of the freshwater mussels and the lack of any knowledge base as to their population levels and distribution, staff recommends funding the distribution work proposed in the study.

Budget effect on base program (Project 25093):

FY 2002	FY 2003	FY 2004
Increase $220,000	Increase $228,000	Increase $237,000

BPA Funding Decision	**BPA Funding Decision:** Fund	**Date:** 3/6/2002	**Rec$:** 220,000

Comment:

Project 200200600: Evaluate Bull Trout Movements in the Tucannon and Lower Snake Rivers

Mike Faler, U.S. Fish and Wildlife Service

We successfully collected, radio-tagged, and PIT tagged 40 bull trout at the Tucannon Hatchery trap in spring 2002. An additional 65 bull trout were also collected and PIT tagged by June 24, at which time we ceased PIT tagging operations because water temperatures were reaching 16.0°C or higher on a regular basis. The movements of radio-tagged bull trout have been monitored weekly since their release, and to date, none of these fish have migrated out of the Tucannon Sub-basin. No radio-tagged bull trout have yet entered Lower Monumental Pool.

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Additional Documents:

25053 Narrative (MS Word, 124 kb)

Reviews and recommendations

Section 1. General administrative information

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Manager of program authorizing this project Howard Burge

Province Columbia Plateau **Subbasin** Mainstem Snake

Short description
Determine spatial and temporal distribution of migratory bull trout in the Tucannon River and Lower Snake River. Estimate “take” and identify passage limitations in the Snake River resulting from the hydropower system.

Target species
Bull Trout (Salvelinus confluentus)

Project Location

Latitude	Longitude	Description
46	118	Tucannon River and the Lower Snake River - particularly at or between Lower Monumental and Little Goose Dams. This project is proposed for both the Tucannon and Mainstem Snake Subbasins.

Section 2. Past accomplishments

(not applicable)

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Section 3. Relationships to other projects

Project #	Title/description	Nature of relationship
199401807	Continue with Implementation of the Pataha Model Watershed Plan	The proposed project will provide information about bull trout distribution and movements in the Tucannon River that may effect the model watershed project for planning and implementing habitat improvement projects in Pataha Creek, a Tucannon tributary.
199401806	Implement the Tucannon River Model Watershed Plan to restore salmonid habitats.	The proposed project will provide information about bull trout distribution and movements that should be of benefit to the model watershed project for planning and implementing habitat improvement projects.

Section 4. Objectives

Task-based budget

Objective	Task	Duration in FYs	Estimated FY 2002 cost	Subcontractor
1. Determine the spatial and temporal distribution of adult migratory bull trout in the Tucannon and Lower Snake rivers.	a. Prepare documents for state collection permit and intraservice consultation (ESA) approval. Forms submitted for Section 10, Take Authorization submitted in March, 2001.	ongoing	0	
	b. Purchase 40 radio-tags from Lotek Engineering.	2002-2004 (3)	12,200	
	c. Purchase 2 dsp compatible radio receivers from Lotek Engineering.	2002 (1)	24,400	

	d. Surgically implant radio tags in 20-40 bull trout of appropriate size (dependant on run size) captured at the Tucanon Hatchery trap. PIT tag all captured bull trout (WDFW will assist).	2002-2004 (3)	18,140	X
	e. Establish and monitor/download a fixed-site receiver on the lower Tucannon River to detect fish movements past this location. (WDFW responsibility).	2002-2005 (4)	731	X
	f. Monitor movements of radio-tagged bull trout in the Tucannon River by truck at least once per week, year round. (WDFW responsibility).	2002-2005 (4)	14,260	X
	g. Establish and monitor/download a fixed-site receiver at the Tucannon Fish Hatchery periodically when bull trout are likely to be moving in the upper Tucannon River. (WDFW responsibility).	2002-2005 (4)	610	x
	h. Monitor movements of radio-tagged bull trout in the Tucannon and Snake rivers by aircraft monthly, between the months of November and May (7 observations/fish/year).	2003-2005 (3)	0	
	i. Monitor movements of radio-tagged bull trout in the Snake River by shoreline and boat bi-monthly between the months of November and May (14 observations/fish/year)	2003-2005 (3)	0	

2. Determine bull trout use and passage efficiency in fishways at Lower Snake River dams.	a. Coordinate with University of Idaho Cooperative Fishery Research Unit to activate and/or re-establish fixed data logging sites at the fishways in Lower Monumental and Little Goose dams.	ongoing	2,440	
	b. Operate and download data weekly at fixed telemetry sites from November through May(28 downloads/site/year - Univ. of Idaho will assist).	2003-2005 (3)	0	x
	c. Evaluate data to determine bull trout use of the fishways.	2003-2005	0	
	d. Calculate passage rates associated with bull trout that enter adult fishways at the dams.	2003-2005	0	
	e. Compare bull trout passage rates to rates observed from anadromous salmonids	2003-2005	0	
3. Estimate frequency of bull trout fall back at Lower Snake River dams.	a. Plot movements of individual radio-tagged fish to determine timing and frequency of fall back through Snake River dams.	2003-2005	0	
4. Determine if bull trout losses result from movements out of Lower Monumental Pool.	a. Evaluate movement plots of individual radio tagged fish to determine if those individuals that leave Lower Monumental Pool return the following spring.	2003-2005	0	
5. Summarize and distribute the information to others.	a. Compile and summarize data and write annual, and final reports. (WDFW will assist)		0	x
	b. Present information to others in the subbasin at various meetings. (WDFW will assist).		0	x

Reviews and recommendations

This information was not provided on the original proposals, but was generated during the review processes.

ISRP Preliminary Review, ISRP 2001-6	**ISRP Recommendation:** Fundable - no response required	**Date:** 6/15/2001	**Rec$:** N/A
Comment: Fundable. This proposal is result of careful planning and thinking. Unfortunately, its success may be limited by a lack of suitable fish for tagging. Can some arrangement be made to delay the project if a useful number of fish are not available this year? Agency accounting procedures may preclude the investigators from delaying project implementation for a year if the fish are not available. The project intends to collect information that is not now available on bull trout movements. This project is timely in that it would make use of telemetry equipment already set up by USGS at the regional dams of interest (Snake R. dams). A few extra telemetry stations on the Tucannon would add to the network that could remotely detect the tagged bull trout. Some additional manual tracking would be needed where fixed monitors are not available. It seems like a good opportunity to learn more about the potential long-range migrations of this still somewhat mysterious species. They might consider acoustic tags for alternative marking schemes for some components (e.g., bull trout utilization of deepwater habitats or reservoirs).			
Sponsor Response to the ISRP's Preliminary Comments: N/A			
CBFWA Review Comments	**CBFWA Recommendation:** High Priority	**Date:** 8/3/2001	**Rec$:**0
Comment: Tied to the USFWS bull trout bi-op.			
ISRP Final Review, ISRP 2001-8	**ISRP Recommendation:** Fund	**Date:** 8/8/2001	**Rec$:** N/A
Comment: Fundable. This proposal is result of careful planning and thinking. Unfortunately, its success may be limited by a lack of suitable fish for tagging. Can some arrangement be made to delay the project if a useful number of fish are not available this year? Agency accounting procedures may preclude the investigators from delaying project implementation for a year if the fish are not available. The project intends to collect information that is not now available on bull trout movements. This project is timely in that it would make use of telemetry equipment already set up by USGS at the regional dams of interest (Snake R. dams). A few extra telemetry stations on the Tucannon would add to the network that could remotely detect the tagged bull trout. Some additional			

manual tracking would be needed where fixed monitors are not available. It seems like a good opportunity to learn more about the potential long-range migrations of this still somewhat mysterious species. They might consider acoustic tags for alternative marking schemes for some components (e.g., bull trout utilization of deepwater habitats or reservoirs).			
BPA Review Comment: N/A			
NWPPC Funding Recommendation	**NWPPC Recommendation:** Fund	**Date:** 11/2/2001	**Rec$:** 81,626
Comment:			
BPA Funding Decision	**BPA Funding Decision:** Fund	**Date:** 3/6/2002	**Rec$:** 81,626
Comment: BPA intends to fund as implementation of the USFWS' Bull Trout Biological Opinion (actions 11.A.3.1.d and 11.A.3.1.f.) The proposal needs to be coordinated with any COE plans to expand the counting period of Snake River dams. Consideration should be given to expanding the proposal to integrate radio tagging of Bull Trout populations from other Snake River tributaries to assess their movement past Snake River dams - make use of proposed radio receiver effort. The proposal could benefit from some minor additional tasks and budget (probably <10%) to collect bull trout for radio tagging in the lower Tucannon and to radio tag specimens that occur incidentally in the juvenile collection systems at lower Snake River dams. This will better satisfy the USFWS' Biological Opinion and help address an ISRP concern about sufficient samples.			

Project 199405400: **Migratory Patterns, Population Structure, Abundance, and Status of Bull Trout in the Columbia Plateau and Blue Mountain Provinces (Previous Title:Bull Trout Life History, Genetics, Habitat Needs, and Limiting Factors in Central and Northeast Oregon.**

Alan Hemmingsen, Oregon Department of Fish and Wildlife

Although spawning surveys are increasingly being used to monitor bull trout populations, the relationship between redd counts and adult population size has not been evaluated extensively. We initiated a three-year study to evaluate methods of estimating the abundance of adult bull trout in the Mill Creek watershed (Walla Walla basin), which is suspected to support fluvial and resident bull trout. Fluvial adults were counted, marked, and inspected for maturity (using ultrasound) at a diversion dam downstream from spawning areas. An estimate of population size in an area upstream of the dam was obtained using expanded snorkel counts and removal estimates. A sample of resident-sized fish (<300 mm) captured during the removal estimates was inspected for maturity using endoscopy. These population estimates were compared to dam counts and redd counts.

We used a protocol developed by the EPA's Environmental Monitoring and Assessment Program (EMAP) to assess the distribution and abundance of adult bull trout in Columbia Plateau Province. Our goal is to develop a rigorous adult monitoring program in support of conservation and recovery efforts for bull trout. We developed a systematic randomized design to sample bull trout spawning streams within the four Province basins. We conducted repeat spawning surveys at 116 sites, each 1.6 km long. In the Walla Walla and Umatilla basins, the EMAP estimate was compared to basin-wide census redd counts.

FY 2002 Columbia Plateau Province Proposal

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Additional Documents:

199405400 Narrative (MS Word, 88 kb)
199405400 Sponsor Response to the ISRP (MS Word, 72 kb)

Reviews and recommendations

Section 1. General administrative information

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Manager of program authorizing this project Robert Hooton

Province Columbia Plateau **Subbasin** John Day

Short description
To aid in conservation efforts, assess the population structure of bull trout in the John Day River subbasin, explore methods to monitor the abundance of bull trout in Mill Creek, and describe the piscivorous nature of bull trout in various environments.

Target species
Bull trout, (Salvelinus confluentus).

Project Location

Latitude	Longitude	Description
44.75	119.45	Multiple areas within the John Day River subbasin, including S.F. Desolation Cr., Baldy Cr., Big Cr., Clear Cr., Call Cr., and Indian Cr.
45.90	118.10	Mill Creek and tributaries, in the Walla Walla River subbasin.

Section 2. Past accomplishments

1996	Completed sampling and DNA analysis of 46 populations of bull trout in Oregon, Washington and Idaho to describe genetic structure of bull trout populations.
1996	Collected of summer temperature data from streams which contain bull trout and brook trout.
1996	Completed multiple pass spawning surveys of three streams, three exploratory surveys.
1996	Completed the 1995 Annual Report.
1997	Conducted distribution and habitat surveys of 17 streams with sympatric populations of bull trout and brook trout (began in 1996).
1997	Conducted radio telemetry study of movements and habitat use of bull trout juveniles and adults.
1997	Collected of summer temperature data from streams which contain bull trout and bull trout.
1997	Completed multiple pass spawning surveys of three streams, two exploratory surveys.
1997	Completed statewide bull trout distribution maps (entered into GIS system).
1997	Made two presentations at the annual meeting of the Oregon Chapter, American Fisheries Society.
1997	Completed the 1996 Annual Report.
1998	Completed fieldwork portion of enclosure study of bull trout/brook trout interactions, growth and feeding behavior.
1998	Conducted radio telemetry study of movements and habitat use of bull trout juveniles and adults.
1998	Collected of summer temperature data from streams which contain bull trout and bull trout (ongoing).

1998	Conducted adult and juvenile movement studies in upper John Day and Walla Walla subbasins (ongoing).
1998	Completed multiple pass spawning surveys of three streams, spawner population estimate of one stream, and one exploratory survey (ongoing).
1998	Completed thermal videography of Wenaha River (Grande Ronde subbasin).
1998	Made two presentations at the annual meeting of the Oregon Chapter, American Fisheries Society.
1998	Made two presentations at the annual Salvelinus confluentus Curiosity Society workshop.
1998	Made two presentations at the special bull trout meeting of the North Pacific International Chapter, American Fisheries Society.
1999	Completed analysis of bull trout/brook trout interactions.
1999	Completed laboratory description of bull trout and brook trout diets.
1999	Conducted radio telemetry study of movements and habitat use of bull trout juveniles and adults in upper John Day, Walla Walla, Grande Ronde, and Deschutes river subbasins.
1999	Collected of summer temperature data from streams which contain bull trout and brook trout (ongoing).
1999	Conducted adult and juvenile movement studies (traps) in upper John Day, Walla Walla, and Deschutes river subbasins (ongoing).
1999	Conducted distribution and habitat surveys of three stream systems with sympatric populations of bull trout and brook trout in the Deschutes River subbasin.
1999	Completed multiple pass spawning surveys of three streams and exploratory surveys in four streams (ongoing).
1999	Estimated age at maturity and spawner abundance in one population of bull trout with resident life history form.
1999	Made one presentation at the annual meeting of the Oregon Chapter, American Fisheries Society.
1999	Made one presentations at the special bull trout meeting of the North Pacific International Chapter, American Fisheries Society.
2000	Presented data at and participated in US Fish and Wildlife sponsored, Recovery Team meetings (ongoing).
2000	Completed, submitted, and defended master's thesis at Oregon State University on the interactions of bull and brook trout.
2001	Completed the 1997 Annual Report.
2001	Completed the 1998 Annual Report.

2001	Distributed master's thesis on bull and brook trout interactions to regional biologists and managers.
2001	Made one presentation at the annual meeting of the Oregon Chapter, American Fisheries Society.
2001	Presented data at and participated in US Fish and Wildlife sponsored, Recovery Team meetings (ongoing).

Section 3. Relationships to other projects

Project #	Title/description	Nature of relationship
199306600	Northeast Oregon Fish Screening and Passage Project.	Supportive. The population structure of bull trout may be influenced by or reflect screening and passage issues.
200003100	North Fork John Day Habitat Project.	Supportive. Population structure may be influenced by or reflect habitat availability.
199801800	John Day Watershed Restoration Project.	Supportive. Passage improvement is likely related to connectiveness and population structure.
199801700	Eliminate Gravel Push-Up Dams on Lower North Fork John Day.	Supportive. Improvements in habitat and ability to migrate may be related to the connectivity between bull trout populations and their population structure.
199606400	Walla Walla, Touchet, and Mill Creek Riparian Habitat Enhancement.	Supportive. Enhanced habitat in Mill Creek may support larger numbers of bull trout. The proposed study would maintain and improve a database on the abundance of bull trout in Mill Creek.
200001270	Monitor and Evaluate the Natural Production, Distribution, Abundance and Genetics of Salmonids.	Supportive. The proposed study would document and maintain a database on the abundance of bull trout in Mill Creek.
199405400	Bull Trout Genetics, Habitat Needs, Life History…	Supportive. The Confederated Tribes of the Warm Springs Reservation have, and plan to continue, focusing efforts on monitoring abundance in the Descutes River bsain. Results from the proposed project will compliment those from the Deschutes River.

Section 4. Objectives

Task-based budget

Objective	Task	Duration in FYs	Estimated FY 2002 cost	Subcontractor
Objective 1. The first objective of this project is to characterize the fine-scale population structuring of bull trout within the John Day River subbasin.	Task 1.1. Using previously collected samples that are archived (Indian Creek, Big Creek, South Fork desolation Creek, Baldy Creek, and Clear Creek from the North Fork John Day River), reanalyze three additional loci.	1	3,100	x
	Task 1.2. To supplement archived samples, collect fin tissue from 30 additional fish in each of Reynolds Creek, Indian Creek, South Fork Desolation Creek, Call Creek, Clear Creek from the Middle Fork of the John Day River, Big Creek, Baldy Creek, and Cle	1	20,200	
	Task 1.3. Analyze genetic variation among local populations from samples using a combination of data from four microsatellite loci previously analyzed and three additional loci. Samples will be analyzed, likely the year following collections, by the Wil	1	0	x
	Task 1.4. Publish results of the analysis annual reports and peer reviewed publications as well as present these results at technical meetings.	1	2,100	

Objective 2. The second objective of this project is to compare methods that estimate the abundance of spawning bull trout in Mill Creek, a tributary with both migratory and resident spawners.				
Subobjective 2.1. Estimate the abundance of migratory (fluvial) adult bull trout in Mill Creek.	Task 2.1.1. Count and measure upstream migrants passing the Mill Creek diversion dam.	3	13,500	x
	Task 2.1.2. Determine size at maturity and the proportion of mature individuals among upstream migrants using ultrasound or endoscopy (see Hemmingsen et al. in press).	3	7,500	
	Task 2.1.3. Mark upstream migrants passing the diversion dam.	3	2,500	x
	Task 2.1.4. Estimate total abundance above the diversion dam using snorkel counts of marked and unmarked bull trout and mark-recapture analysis.	3	2,500	
Subobjective 2.2. Estimate the number and size of bull trout redds and determine the size of females responsible for those redds.	Task 2.2.1. Conduct extensive bi-weekly spawning surveys (see Bellerud et al. 1997).	3	11,000	

	Task 2.2.2. Calculate sampling error for redd counts using data from Hemmingsen et al. (in press).	3	2,500	
	Task 2.2.3. Determine if a relationship exists between redd size and female spawner size. If such a relationship does exist, estimate the number of redds made by fluvial and resident female spawners.	3	2,500	
Subobjective 2.3. Determine the accuracy and precision of redd counts as a measure of the abundance of fluvial bull trout.	Task 2.3.1. Compare redd counts to dam counts and mark-recapture estimates.	3	2,500	
Subobjective 2.4. Estimate the number of resident adult bull trout.	Task 2.4.1. Estimate densities of bull trout (< 300 mm) in randomly selecting stream reaches. Reach length will be set at 30 times the active channel width (or approximately 100 m). Reaches would be snorkeled and calibrated for snorkeling efficiency.	3	5,250	
	Task 2.4.2. Determine size at maturity and the proportion of mature individuals using ultrasound or endoscopy (see Hemmingsen et al. in press).	3	3,750	
	Task 2.4.3. Extrapolate densities of adults to produce an estimate of total population size using area-under-the-curve techniques (Dambacher et al. 1999).	3	2,500	

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Subobjective 2.5. Determine the accuracy and precision of redd counts as a measure of the abundance of resident bull trout.	Task 2.5.1. Compare redd counts to surveys estimates of resident bull trout.	3	2,500	
Subobjective 2.6. Disseminate information in a timely and effective manner.	Task 2.6.1. Publish results of the analysis annual reports and peer reviewed publications as well as present these results at technical meetings.	3	2,500	
		Total	86,400	

Reviews and recommendations

This information was not provided on the original proposals, but was generated during the review processes.

ISRP Preliminary Review, ISRP 2001-6	**ISRP Recommendation:** Fundable only if response is adequate	**Date:** 6/15/2001	**Rec$:** N/A

Comment:

Fundable if adequate responses are given to ISRP concerns. The stated objective is to test night snorkeling efficacy versus day snorkeling or electrofishing is likely not necessary. Night snorkeling is generally recognized as an efficient method for detecting bull trout. There may be logistical reasons to explore to the relationship between detections based on day snorkeling and day electrofishing, however the proposal could have described this need more compellingly. Thus, the need for tasks associated with this objective need to be better justified to support funding. For the purposes of management of bull trout in the Deschutes basin, it is doubtful that the precision generated by the methods comparison is necessary. Relative abundance and trend data probably give sufficient resolution for most management level questions.

The proposal implies that part of the rationale for the comparison of sampling methods is the inclusion of the Deschutes data into a larger regional bull trout dataset being assembled by Russ Thurow and colleagues at the USFS Rocky Mountain Experiment Station in Boise. The presentation amplified this relationship. The proposal needs to provide additional documentation on the linkage to the USFS regional protocol and the involvement of Thurow et al., even if no funding is allocated to the Boise station.

Study reaches need to be selected in cooperation with Projects #25088 and #25010. Use of index reaches (Objective 1 and 3) or survey of known spawning ground surveys

(Objective 3) have proven to be unacceptable in most fisheries monitoring and evaluation programs, e.g., the Oregon Coastal Coho surveys where they have been replaced by probabilistic sampling procedures developed by the EPA\EMP program. Selection of long-term sampling reaches for this project should be selected in cooperation with Projects #25088 and #25010. “Index sites” could be used for development of subsampling procedures, but they should be part of a systematic sample of collocated sites if possible.

Sponsor Response to the ISRP's Preliminary Review		**Date:**6/29/2001	
CBFWA Review Comments	**CBFWA Recommendation:** High Priority	**Date:** 8/3/2001	**Rec$:**0

Comment:

This project now includes the proposed work submitted by the CTWSRO under the same project number as well as Objective 4 of the original 25088 proposal (i.e., pre-ISRP review) that was submitted by ODFW. ODFW and the CTWSRO will be cooperators on this project. The RFC questions whether it is BPA's responsibility to fund AFS protocol evaluations. The RFC also indicated that all ODFW bull trout proposals that will be submitted in the upcoming provinces should be grouped under one project number (i.e., 199405400)

ISRP Final Review, ISRP 2001-8	**ISRP Recommendation:** Fund	**Date:** 8/8/2001	**Rec$:** N/A

Comment:

Fundable. The response addressed the ISRP’s concerns very well.

BPA Review Comment: N/A

NWPPC Funding Recommendation	**NWPPC Recommendation:** Fund	**Date:** 11/2/2001	**Rec$:** 488,027

Comment:

Project 199405400 Characterize the Migratory Patterns, Structure, Abundance and Status of Bull Trout in the Plateau represents a joint ODFW and CTWSRO project, plus the bull trout component of Project 25088 (see Council comments for proposal 25088). The project includes ongoing work from a CTWSRO component for the Deschutes (see Deschutes Issue 3) and an ongoing ODFW component in the John Day. It also includes the bull trout EMAP assessment work that had been an aspect of ODFW project 25088. CBFWA and ISRP agreed on a fundable - high priority recommendation for the project. Project sponsors note that conglomerating these tasks results in a 5% savings over what it would have cost to fund the tasks separately.

Staff Recommendation: Funding depends on Council resolution of General Issue 7 (bull trout new work) and the application of the proposed funding criteria that relate to new assessment work (for the effect on assessment work portion of the proposal). Much of the work in the project is ongoing and would merit continued funding under the funding

from the Fish and Wildlife Service also recommended that the project be supported to meet measures and terms and conditions in the BiOp. The new work involving tasks added from project 25088 would appear to be assessment type of activities. This work was also supported by the Service and appears to support subbasin planning under the Council's program.

Budget effect on base program (Project 199405400):

FY 2002	FY 2003	FY 2004
Increase $154,340	Increase $154,340	Increase $154,340

BPA Funding Decision	BPA Funding Decision: Fund	Date: 3/6/2002	Rec$: 488,027

Comment: Bund - BPA will seek additional review of project objectives with the project sponsor in order to arrive at an appropriate budget during the contracting process.

Project 199701900; Evaluate the Life History of Native Salmonids in the Malheur Basin

Lawrence Schwabe, Burns Paiute Tribe

Past land use practices and construction of hydroelectric facilities have degraded the Upper Columbia basin to the point where survival of the remaining native salmonids are severely threatened. The goal of this project is to gain an understanding of the life history and genetic composition of the native salmonids within the Malheur River Basin. Information is limited concerning native trout populations, seasonal distribution and movements throughout the Malheur River. What information there is indicates that bull trout *Salvelinus confluentus* are severely threatened. This project outlines a plan to assess salmonid population structure and dynamics through the use of radio telemetry, screw traps and genetic analyses. This project will assist the Burns Paiute Tribe (BPT) in achieving the goals and objectives defined in the Northwest Power Planning Council's 1994 Columbia River Fish and Wildlife Program. This project also complements the management plans outlined in the Oregon Department of Fish and Wildlife's (ODFW) Malheur Management plan of 1990 and is in line with the Malheur River basins bull trout recovery teams, goals and objectives. Research findings will be the basis of recommendations for enhancement and protection strategies that are in line with council measures. Implementation of these strategies will provide better information for fish & wildlife managers as well as irrigation districts when making decisions concerning native salmonids within the Malheur basin. These strategies will also help provide the native salmonids with more suitable habitat and help increase population numbers.

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for more detail, see the summary for this project at BPA

see last year's proposal

see CBFWA and NWPPC reviews

Section 1. General administrative information

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Manager of program authorizing this project Daniel Gonzalez

Province Middle Snake **Subbasin** Malheur

Short description
Evaluate and determine the life history, distribution, and critical habitats pertinent to populations of redband and bull trout in the Middle Fork Malheur subbasin.

Section 2. Past accomplishments

1997	17 miles of stream survey on Summit Creek.
1997	Fish Survey's conducted on Wolf Creek, East Fork Wolf Creek.
1998	Spawning surveys conducted on West Fork Big Meadow Creek, Lake Creek.
1998	Fish Survey's conducted on Crooked Creek and McCoy Creek; bull trout found in Crooked Creek (bull trout are considered "not present" in this drainage).
1998	30 miles of stream survey on Wolf Creek and East Fork Creek
1998	Administered a FLIR flight over the North Fork and Upper Malheur River to identify coldwater refugia areas.
1999	Documented adult bull trout seasonal migration with in the North Fork Malheur River.

1999	Documented timing and critical spawning areas for bull trout in the North Fork and Upper Malheur River through spawning surveys and redd counts conducted in the fall..
1999	Angling regulations changed to artificial lure and fly only to protect bull trout and redband trout from incidental angling mortality.
1999	Salmonid population estimate for Crooked creek, tributary of the Upper Malheur River (ODFW protocol).
1999	Documented bull trout entrainment over Agency Valley Dam. and down stream migration of bull trout though radio telemetery.
1999	Change in land use practices on public land due to results of bull trout research.
2000	Bureau of Reclamation is changing spill operation at Beulah Reservoir to reduce entrainment. Research is now being done to develop alternatives.
2000	Continued to monitor adult bull trout trend data through spawning surveys and redd counts.
2000	Population estimate for salmonids in Bosonberg creek, tributary to the Upper Malheur River (ODFW protocol).
2000	11.86 miles of stream survey on the Upper Malheur River.
2001	Documented adult bull trout seasonal migration in the Upper Malheur River.
2001	Continued to monitor adult bull trout trend data through spawning surveys and redd counts.
2001	Redband genetic analysis comparing redband populations with in the Columbia basin.
2001	Population estimates of salmonids in Summit Creek (ODFW protocol).
2001	Population estimates of salmonids in McCoy Creek (ODFW protocol).
2001	15 miles of stream survey in the North Fork Malheur River.
2001	Presence absence and upper limits fish surveys in Wolf Creek, Pine Creek, Muddy Creek, Little Muddy Creek, Calamity Creek and Gunbarrel Creek.

Section 3. Objectives

Task-based budget

Objective	Task	Duration in FYs	Estimated FY01 cost	Subcontractor
1.) Document the complete migratory patterns of bull trout in the Malheur basin at and above Warm Springs Reservoir and Beulah Reservoir.	a.) Weir traps will be placed on the Middle Fork Malheur River which is designated "Wild and Scenic". The USFS will complete all necessary documents for the installation of the weir traps.	4	0	
	b.) Radio tag 20 bull trout and PIT tag about 100 that are captured at the weir trap in the Middle Fork Malheur River.	4	65,650	
	c.) Snorkel with dipnets and use hook and line survey for bull trout in tributaries to the Middle Fork Malheur; PIT bull trout larger than 150 mm and radio tag fish if necessary. (Costs included in Objective 1, task a.)	1	0	
	d.) Recapture PIT tagged fish in the weir trap, by angling, and by snorkeling with dipnets (Cost included in Objective 1, Task a).	1	0	
	e.) Use radio telemetry to track migration patterns of bull trout in the Middle Fork Malheur basin.	4	34,240	

2.) Determine population trends and age class structures in bull trout and redband trout	a.) Continue monitoring spawning activity in documented areas and any new areas identified through the use of radio telemetry (Cost included in Objective 1, task b).	4	0	
	b.) Determine population trend of adult bull trout spawners by past and present spawning surveys.	4	13,800	
	c.) Gather scale samples from bull and redband trout caught during the project (Cost for collecting samples are included in objective 1.a, ODFW will do the analysis of scales).	4	0	
3.) Determine water quality parameters in the Malheur basin.	a.) Continue using thermographs to gather data on established sites.	4	1,229	
4.) Determine the timing of spawning and preferred spawning sites.	b.) Continue monitoring the locations and timing of bull trout spawning activities via radio telemetry in the Middle Fork Malheur and tributaries. (Cost included in Objective 1, task d).	1	0	
	c.) GPS all redds counted in the spawning surveys and enter into GIS to determine spawning site preference (Cost included in Objective 2, task b).	4	0	
5.) Determine bull trout use of Warm Springs and Beulah Reservoir and fish entrainment	a.) Track downstream migration on all radio tagged bull trout until radio expire (Costs included in Objective 1, task d).	4	0	

6.) Evaluate the habitat profile of critical bull trout spawning and rearing tributaries in the Malheur basin.	a.) Stream survey using ODFW 2000 protocol; approximately 30+ miles of mainstem habitat will be surveyed	4	0	
	b.) Electroshock streams which have suspected or potential bull trout populations	4	0	
7.) Determine the genetic variability of redband trout within the Middle Fork Malheur River and Warm Springs Reservoir	a.) Gather 60 samples from the Middle Fork tributaries, 60 from the weir trap located in the mainstem, and 60 samples from Warm Springs Reservoir that are to be analyzed by the University of Montana	1	0	
8.) Determine cold water micro-refugia within the Middle Fork Malheur Basin	a.) Snorkel cold water micro-habitats identified from FLIR data and determine bull and redband trout utilization.	1	0	

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Reviews and recommendations

This information was not provided on the original proposals, but was generated during the review processes.

ISRP Preliminary Review, ISRP 2002-2	**ISRP Recommendation:** Fundable only if response is adequate	**Date:** 3/1/2002	**Rec$:** N/A
Comment: A response is needed. The management application of data previously generated by this project looks strong. The focus of this project is solely on bull trout; has work on redband trout been completed? Is the information already gathered by this project, augmented by literature, sufficient to develop a bull trout recovery plan? Although discussed following the presentation, the proposed focus on sub-adult fish needs better justification. Other than the knowledge gap, why focus on this life-stage? Has work on adult fish been completed? The proposal does well at describing methods but does not attempt to frame testable hypotheses. Asking "what do fish do" in the face of poor summer environmental conditions is a good start but should be followed by some hypotheses that can be tested by the data to be gathered. This should be done for objectives 1, 2, 5, and 7 and some			

objectives will require multiple hypotheses. The proposal largely ignores bull trout work done elsewhere. Those results should be used to help develop quality hypotheses. Adult bull trout information already acquired by this project should also be used in sub-adult hypothesis generation for the response. Why were there no even-numbered objectives in the proposal except for #2?			
Sponsor Response to the ISRP's Preliminary Review		**Date:** 3/15/2002	
CBFWA Review Comments	**CBFWA Recommendation:** High Priority	**Date:** 5/17/2002	**Rec$:** 324,401
Comment:			
ISRP Final Review, ISRP 2002-11	**ISRP Recommendation:** Fund	**Date:** 6/7/2002	**Rec$:** N/A
Comment: Fundable in part to complete work in progress. BPT staff have done some good work with this project, but it is time to complete tasks in progress and move on to projects elsewhere in the subbasin. Recently gathered data seem to make a strong case for the need for a conservation pool in Beulah Reservoir based on its use by adult bull trout and the process for implementation appears underway with BOR negotiations. In the proposal for new work, staff propose to continue for another cycle by tracking sub-adults. The ISRP believes there is minimal justification for this, and the response, although clear, was not convincing.			
BPA Review Comment	**BPA Rank:** B	**Date:** 7/23/2002	**RPA: no**
Comment: Do not recommend. May not be an FCRPS responsibility to mitigate above Hells Canyon dam if not affected by the construction or operation of Black Canyon, Anderson Ranch, Boise Diversion, Minidoka, or Palisades reservoirs. Although there have been prior bull trout assessments in this basin, BPA is reassessing its obligation to mitigation for bull trout above areas blocked by non-Federal dams.			
NWPPC Funding Recommendation	**NWPPC Recommendation:** Fund	**Date:** 10/30/2002	**Rec$:** 324,401
Comment: **Project Issue 3:** Burns Paiute Tribe ongoing project 199701900 Evaluate Life History of Native Salmonids in the Malheur Basin This project was rated "Fund in Part" by the ISRP. The ISRP supported wrapping up the work, noting that it seems to have been quality work that has gathered the information necessary and drawn solid conclusions. The United States Fish and Wildlife Service and sponsor believe that additional work needs to continue. The USFWS has provided a letter supporting the project as fully proposed, and states that this work could be important for			

Recovery Planning purposes. Bonneville gave the project a "B" rating, and indicated that it is not yet convinced that there is an FCRPS linkage to the project.

Council Recommendation: Because the ISRP comments were not critical of the work or its conclusions, and the USFWS believe that the work has ESA utility, the staff recommends support for this ongoing project. Bonneville has apparently found the FCRPS connection that it requires for funding this project to date, and this should not be an issue in light of that history. Funding would be $324,401 in Fiscal Year 2003 and increased by 3.4% in each of the next two fiscal years. The province prioritization meetings demonstrate that the project remains to be a priority of the Middle Snake River province sponsors.

BPA Funding Decision: N/A

Project 198605000: White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers

Dave Ward, Oregon Department of Fish and Wildlife

Project goals are to (1) protect and restore white sturgeon downstream from McNary Dam, and (2) identify potential measures to protect and restore white sturgeon upsttream from McNary Dam. Objectives are (1) implement actions annually that do not involve changes to hydropower system operation and configuration to mitigate for lost white sturgeon productivity, (2) recommend actions that involve changes to hydropower system operation and configuration to optimize physical habitat conditions for white sturgeon, and (3) monitor and evaluate actions to mitigate for lost white sturgeon productivity. Initial project activities from 1986 through 1992 indicated that productivity of white sturgeon in Bonneville, The Dalles, and John Day reservoirs was severely limited. Recommendations included increasing management of fisheries for impounded populations, identifying habitat requirements and the relationship between river discharge and productivity, evaluating the feasibility of restoration through transplants and artificial propagation, and investigating the need for protecting and restoring populations upstream from McNary Dam. Work since 1992 has been based on these recommendations. Annual mitigation activities include intensive management of fisheries in impoundments and transplanting wild juvenile white sturgeon for supplementation in The Dalles and John Day reservoirs. Effects of these mitigation actions are assessed through periodic sampling to index populations. Results indicate that abundances in The Dalles and John Day reservoirs have generally increased as a result of mitigation. In 1999 we began work to refine and evaluate artificial propagation. Work over the next few years will include experimental releases of propagated juveniles. We will also continue to index recruitment of age-0 white sturgeon and relate changes in recruitment to changes in environmental conditions. Work to be completed over the next few years includes making final recommendations concerning operation of the hydropower system to optimize habitat conditions for white sturgeon. We will also complete refinement of a maturation status model for white sturgeon.

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Section 5. Budgets for O & M phase
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Section 7. Budget summary

for more detail, see the summary for this project at BPA

see last year's proposal

see CBFWA and NWPPC reviews

Proposal contact person or principal investigator

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Manager of program authorizing this project David Ward

Province Systemwide **Subbasin** Systemwide

Short description
Restore and mitigate for hydrosystem-caused loss of white sturgeon productivity through intensive fisheries management, supplementation, and modified hydrosystem operation. Assess success of mitigation efforts, and assess losses in unstudied areas.

Section 2. Past accomplishments

1988	Developed methodologies for habitat mapping and modeling, capture gears for various life stages, and marking and aging techniques.
1992	Determined that dams limit movements of white sturgeon and have functionally isolated populations in mainstem Columbia River reservoirs.
1992	Described population dynamics and found them to be unique in each reservoir.
1992	Found population productivity to be 10-100 times higher downstream from Bonneville Dam than in Bonneville, The Dalles, or John Day reservoirs.
1992	Identified reduced flows and subsequent poor recruitment as a potential factor limiting white sturgeon productivity in impoundments
1992	Determined reservoirs provide large areas of suitable habitat for juvenile and adult white sturgeon, but compensatory population responses may reduce productivity if carrying capacity is exceeded

1992	Determined over-fishing had occurred in Bonneville, The Dalles, and John Day reservoirs, and described appropriate exploitation rates under the reduced productivity resulting from the development and operation of the hydrosystem.
1998	Demonstrated increased abundance of white sturgeon in The Dalles and John Day reservoirs, which was attributable to intensive harvest management and reduced exploitation.
1998	Developed two indices of relative abundance for age-0 white sturgeon.
1998	Determined that white sturgeon larvae are susceptible to gas bubble trauma in laboratory experiments.
1998	Determined that hydropeaking at The Dalles Dam displaces white sturgeon eggs and larvae from incubation areas.
1998	Provided a broad recommendation for flows to provide spawning habitat.
1998	Found that white sturgeon transplanted to The Dalles Reservoir demonstrated excellent survival and growth one and two years later.
1998	Developed habitat maps and flow-habitat models for the Columbia River up to Priest Rapids Dam.
1998	Completed initial population estimates for white sturgeon in McNary, Ice Harbor, Little Goose, and Lower Monumental reservoirs, and the Hanford Reach.
2002	Maintained increases in abundance of white sturgeon in The Dalles and John Day reservoirs, which again was attributable to intensive harvest management and reduced exploitation.
2002	Developed a discriminant function analysis model to predict white sturgeon sex and stage of maturity using blood plasma indicators, sex steroids and calcium, and fork length.
2002	Implemented an annual sampling program to index relative abundance for age-0 white sturgeon.
2002	Included annual transplants of white sturgeon from below Bonneville Dam to The Dalles and John Day reservoirs as an ongoing component of the project.
2002	Initiated work to evaluate the feasibility of using hatchery-reared white sturgeon to supplement depressed populations.
2002	Completed index sampling to develop initial descriptions of white sturgeon populations in Rock Island Reservoir, Lake Rufus Woods, and Lake Roosevelt

Section 4. Objectives

Task-based budget

Objective	Task	Duration in FYs	Estimated FY01 cost	Subcontractor
1. Develop and implement mitigation actions that do not involve changes to hydrosystem operation and configuration.	a. Transplant approximately 10,000 juvenile white sturgeon from areas downstream from Bonneville Dam to The Dalles and John Day reservoirs (ODFW).	Ongoing	130,935	
1.	b. Collect, hold, and spawn wild white sturgeon to produce age-specific cohorts and evaluate the feasibility of using artificial propagation as a mitigation tool (CRITFC and USFWS).	2	331,236	
1	c. Conduct laboratory experiments to determine the size at which artificially-propagated white sturgeon should be stocked to avoid predation (USGS).	1	82,982	
2. Develop and implement mitigation actions that involve changes to hydrosystem operation and configuration.	a. Describe the effects of daily dam operations on spawning by white sturgeon by using telemetry to monitor behavior of pre-spawn and spawning fish (USGS).	1	46,523	
2.	b. Describe the effects of dam operations on recruitment by correlating habitat measures with indices of recruitment (USGS and USFWS).	1	137,626	

2.	c. Describe the potential effect of reservoir drawdowns on the physical habitat available for white sturgeon in John Day, Ice Harbor, Lower Monumental, Little Goose, and Lower Granite reservoirs (USGS).	1	46,522	
3. Monitor and evaluate actions to mitigate for lost white sturgeon production due to development, operation, and configuration of the hydrosystem.	b. Determine if the indices developed from trawling and gillnetting follow similar trends with changes in densities that result from variable recruitment (WDFW, ODFW, and CRITFC).	2	176,482	
4. Assess losses to white sturgeon productivity caused by development and operation of the hydrosystem.	a. Determine if reduced turbidity caused by hydrosystem development influences predation on age-0 white sturgeon (USGS).	2	82,982	
4.	b. Determine sex, maturational status, and reproductive potential of sturgeon in impounded and unimpounded reaches and correlate disease load with reproductive fitness (OSU).	2	88,830	
5 Develop and implement mitigation actions that do not involve changes to hydrosystem operation and configuration.	d. Continue intensive fisheries management and monitoring of harvest in Bonneville, The Dalles, and John Day reservoirs (WDFW, ODFW, and CRITFC).	Ongoing	491,240	

6 Monitor and evaluate actions to mitigate for white sturgeon production due to development, operation, and configuration of the hydropower system.	a. Monitor the effects of mitigation actions on impounded populations of white sturgeon (John Day Reservoir in 2001) (ODFW, WDFW, and CRITFC).	Ongoing	397,918	
	c. Describe annual variation in white sturgeon recruitment between Bonneville and Priest Rapids dams on the Columbia River and downstream from Lower Granite Dam on the Snake River (USGS, WDFW, and ODFW).	Ongoing	151,767	

Reviews and recommendations

This information was not provided on the original proposals, but was generated during the review processes.

ISRP Preliminary Review, ISRP 2002-13	**ISRP Recommendation:** Fundable only if response is adequate	**Date:** 8/2/2002	**Rec$:** N/A
Comment: A response is needed. This proposal represents a culmination of nearly ten years of work on white sturgeon biology and management in the Columbia River reservoirs. The project has progressed logically from research on the population status, life history, and habitat requirements of sturgeon through development and implementation of mitigation, management, and monitoring actions based on the research. The accomplishments of the project to date are documented in the proposal (pages 9-11) and in the draft White Sturgeon Program Summary dated February 22, 2002. The researchers have also published numerous papers in well-respected, peer-reviewed fisheries journals (pages 17-19). In their 2000 review of this project, the ISRP recommended that the sponsors develop an umbrella proposal for all sturgeon research in the basin and a long-term strategy and plan indicating how the sponsors are moving toward their objectives. The draft Program Summary appears to fulfill this recommendation. However, the ISRP also called for a peer-reviewed synthesis of the state of the science on Columbia River white sturgeon. This is a highly desirable activity and a description of progress toward this goal or an explanation of why the synthesis has not occurred would be helpful. We do note,			

however, that the sponsors have published numerous peer-reviewed journal articles and are contributing two chapters to a book on North American sturgeon. The proposal lays out a clear description of accomplishments to date and provides a logical plan for completing the research objectives, evaluating mitigation actions, and monitoring population status through 2005. Long-term goals beyond 2005 are not presented. The sponsors need to respond to the following ISRP questions:

1. Both harvest restrictions and transplantation of juveniles from downriver stocks into mainstem reservoirs is occurring simultaneously. What were the harvest restrictions that were implemented? How do the sponsors plan to sort out the effects of each of these mitigation activities sturgeon population dynamics? The sponsors indicate that since implementation of the more intensive harvest management growth of fish has slowed, perhaps indicating a density-dependent effect. How is this phenomenon being addressed? Will transplantation contribute further slowing of growth?

2. Under Objective 1, Task 1b, Phase 2 of monitoring the sponsors propose to estimate survival and recruitment. Specifically, how will this be accomplished?

3. Objective 2 purports to recommend actions that involve changes to the hydrosystem to optimize physical habitat. A much more comprehensive description of how the sponsors plan to accomplish this objective is needed. What information is available and how will it be utilized to produce the recommendations. Task 2a pertains only to completion of the USGS portion of the work, but this work alone is insufficient to provide recommendations for power system changes.

198605000 Sponsor Response to the ISRP		**Date:**8/23/2002	
CBFWA Review Comments	**CBFWA Recommendation:** Urgent	**Date:** 10/24/2002	**Rec$:**1,984,000

Review Comments:

This project has progressed logically from research on the population status, life history, and habitat requirements of sturgeon through development and implementation of mitigation, management, and monitoring actions based on the research. The accomplishments of the project have been published extensively in peer-reviewed journals. The RFC commends the sponsors on developing an umbrella proposal for all sturgeon research in the basin. The proposal provides a clear description of accomplishments to date and provides a logical plan for completing the research objectives, evaluating mitigation actions, and monitoring population status through 2005.

Budget Comments:

Minor reductions for 2003 result from a decrease in the number of PIT tags to be purchased and the deferral of computer purchases. Annual budget for the project has actually decreased since 1997. No increase over 2002 was requested for 2003. The budget has been adjusted accordingly.

ISRP Final Review, ISRP 2002-14	**ISRP Recommendation:** Fund	**Date:** 11/5/2002	**Rec$:** N/A

Comment:

Fundable. We agree with CBFWA's designation of the project as urgent. This proposal represents a culmination of nearly ten years of work on white sturgeon biology and management in the Columbia River reservoirs. The project has progressed logically from research on the population status, life history, and habitat requirements of sturgeon through development and implementation of mitigation, management, and monitoring actions based on the research. The accomplishments of the project to date are documented in the proposal (pages 9-11) and in the draft White Sturgeon Program Summary dated February 22, 2002. The researchers have also published numerous papers in well-respected, peer-reviewed fisheries journals (pages 17-19). The proposal lays out a clear description of accomplishments to date and provides a logical plan for completing the research objectives, evaluating mitigation actions, and monitoring population status through 2005. Long-term goals beyond 2005 are not presented.

In the 2000 review of this project, the ISRP recommended that the sponsors develop an umbrella proposal for all sturgeon research in the basin and a long-term strategy and plan indicating how the sponsors are moving toward their objectives. The draft Program Summary appears to fulfill this recommendation. However, the ISRP also called for a peer-reviewed synthesis of the state of the science on Columbia River white sturgeon. This is a highly desirable activity that still needs to be conducted. We do note, however, that the sponsors have published numerous peer-reviewed journal articles and are contributing two chapters to a book on North American sturgeon.

The sponsors provided satisfactory and detailed answers to the ISRP's questions. The sponsors have expanded cooperative efforts on sturgeon research and management to include a workshop for more than 50 sturgeon biologists and interested scientists from throughout the Basin and are working on establishing a web space and list-server that will allow sturgeon biologists from throughout the Basin to form working groups and contribute to the synthesis.

BPA Review Comment: N/A

NWPPC Funding Recommendations: N/A

BPA Funding Decision: N/A

Project 199405300: Bull Trout Assessment - Willamette/ McKenzie

Jeffrey Ziller, Oregon Department of Fish and Wildlife

During the past decade, the Oregon department of Fish and Wildlife (ODFW) has been involved in partnerships with the U.S. Forest Service (USFS), Federation of Flyfishers and other agencies in a cooperative effort to improve the status of bull trout populations and their habitat in the

Upper Willamette Basin. In 1993, we initiated efforts to reestablished extirpated bull trout populations by transferring young-of-the-year bull trout into appropriate habitats in the Upper Willamette Basin. Through 2002, approximately 15,000 fry have been transferred to two streams in the McKenzie Basin and eight streams in the Middle Fork Willamette Basin. Methods used in monitoring survival include juvenile population estimates using minnow traps or snorkeling, juvenile downstream migrant trapping, adult migrant counting using underwater video and electronic fish counters, and spawning surveys. Monitoring indicates some of the juvenile bull trout transferred are surviving and remaining in the release sites for over two years. In addition, bull trout redds were observed in our initial release stream during 2000 to 2002 surveys. During 2001, we estimated 240 bull trout occupied approximately 9 km of the mainstem Middle Fork Willamette. Between 1995 and 1999, the adult bull trout population in the mainstem McKenzie stabilized at an estimated 200-300 adults. Between 1999-2001, the percentage of spawning bull trout less than 30 cm in length increased from 11% to 46%. Correspondingly, the estimated migration of young-of-the-year decreased from about 18,000 in 2000 to 1,500 in 2002. As a result, only 290 juvenile bull trout were transferred in 2002. Cooperative work between ODFW and its partners will continue to monitor this donor population and evaluate the implementation of the recovery plan.

BPA Fish and Wildlife FY 2001 Budget Update

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for more detail, see the summary for this project at BPA

see last year's proposal

see CBFWA and NWPPC reviews

Section 1. General administrative information

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Manager of program authorizing this project Jeffrey S. Ziller

Province Lower Columbia **Subbasin** Willamette

Short description
Monitor distribution, population trends, and habitat use of bull trout populations in the Upper Willamette Basin. Continue to implement the Rehabilitation Plan for bull trout in Middle Fork Willamette (ODFW 1997).

Section 2. Past accomplishments

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1996	Surveyed over 100 miles of stream for the presence of bull trout. Young of the year bull trout have only been found in known spawning tributaries.
1997	Information collected on this project has allowed ODFW to complete a risk assessment, rehabilitation plan and monitoring program for bull trout in the Middle Fork Willamette River.
1998	Redd surveys conducted in Anderson and Olallie creeks and the mainstem McKenzie show an increasing trend in adult bull trout abundance.
1998	With a downstream migrant trap, we monitored of timing and numbers of juveniles moving downstream in Anderson Creek. Data indicates good spawning success; however, habitat for young of the year bull trout may be limited.
1998	Transfer of 1,497 juvenile bull trout from the McKenzie Basin to the Middle Fork Willamette Basin.
1998	Monitoring of radio transmitters implanted in bull trout has allowed us to describe seasonal movements and habitat use in mainstem McKenzie, South Fork McKenzie, and Cougar Reservoir.
1999	Estimate of the number of spawning adult bull trout in Anderson Creek and Roaring River using electronic fish counters
1999	Transfer of 1,976 juvenile bull trout from the McKenzie Basin to the Middle Fork Willamette Basin.
1999	Confirmed survival of juvenile bull trout transferred from the McKenzie Basin to the Middle Fork Willamette Basin in 1998 and 1999.
1999	Population estimate of juvenile bull trout rearing in Anderson Creek.

Section 3. Objectives

Task-based budget

Objective	Task	Duration in FYs	Estimated FY01 cost	Subcontractor
1. Determine distribution of bull trout in the Middle Fork Willamette and McKenzie river basins.	a. Conduct surveys of potential spawning locations of bull trout in the Middle Fork Willamette and tributaries above Hills Creek Reservoir. Survey locations will be determined from historical ODFW survey data and the distribution of cold water, appr	2	1,375	

	b. Conduct surveys of potential spawning locations in the McKenzie River and tributaries above Trail Bridge Dam; tributaries of the mainstem below Trail Bridge Dam and in the South Fork McKenzie above Cougar Reservoir. Surveys will be conducted in coope	2	1,031	
	c. Determine juvenile bull trout rearing areas by locating fish with snorkeling and electrofishing techniques in habitat identified as suitable for bull trout. Criteria for suitable habitat will include stream segments with appropriate water temperatures	2	1,031	
	d. Locate adult bull trout rearing and spawning areas in the mainstem and South Fork McKenzie rivers by radio tagging up to 10 adult fish during the fall and winter and tracking their movements, at least bi-weekly, through the migration and spawning peri	2	3,437	
2. Determine population size of bull trout in the McKenzie and Middle Fork Willamette basins.	a. Estimate the number of bull trout in the Middle Fork subbasin using calibrated snorkel observations and the results of spawning surveys conducted in Task 1.1. Snorkeling will be conducted at night to enhance the effectiveness of the survey.	12	6,873	

	b. Estimate the number of juvenile bull trout migrating from Anderson Creek using a rotary screw downstream migrant trap and calculating trap efficiency. The migrant trap will be operated approximately 4 d/wk from February through May and at least 4d/mo	2	5,499	
	c. Estimate the number of bull trout residing in Olallie Creek by calibrated night snorkel counts. We will calculate a density estimate based on the calibrated counts and extrapolate for the total area below the springs on Olallie Creek.	1	4,124	
	d. Conduct bi-weekly counts of known spawning areas in Anderson Creek, Olallie Creek and mainstem McKenzie from September 1-October 15.	2	3,437	
	e. Continue using snorkeling gear to count adult bull trout in pools of the mainstem and South Fork McKenzie rivers as an index to pre-spawning bull trout abundance and distribution.	2	2,749	
	f. Utilize estimates of the number of spawning bull trout collected in Task 2.4. to obtain trend data on bull trout populations.	2	344	

3. Determine life history characteristics of bull trout in the Middle Fork and McKenzie river basins.	a. Summarize information collected in Objectives 1 and 2 to identify habitat characteristics of adult and juvenile bull trout rearing areas and spawning locations. Characteristics will include water temperature and flow, substrate type and size, stream	2	687	
	b. Identify the amount of habitat in the McKenzie and Middle Fork Willamette subbasins similar to habitat currently or historically colonized by bull trout in those basins.	2	344	
	c. Calculate the potential size of the Middle Fork Willamette and McKenzie river bull trout populations by extrapolating from the average density of bull trout found in Task 3.1 and the amount of habitat determined in Task 3.2.	2	344	
4. Implement the Rehabilitation Plan for the bull trout population in the Middle Fork Willamette River (ODFW 1997).	a. Transfer young of the year bull trout captured in the rotary screw trap from Anderson Creek to the Middle Fork Willamette River. Fry will be transported from February-April 1998 through 2002. The transportation vehicle is a 250-gallon tank with oxyg	2	13,746	

	b. Conduct snorkel surveys to monitor survival, distribution and growth of bull trout from the release site downstream approximately one kilometer. Estimate growth rates using length at release data and visual estimates of size from snorkel surveys.	12	6,873	
	c. Identify habitat characteristics of juvenile rearing areas including water temperature and flow, stream gradient, substrate size, distance to cover, and habitat complexity (e.g. amount of large wood, pools).	2	1,718	
5. Determine the effectiveness of restrictive angling regulations for maintaining bull trout populations in the Willamette Basin.	a. Estimate catch of bull trout by anglers in Cougar and Trail Bridge reservoirs and calculate potential mortality. Measure angler catches, the degree of angler compliance and knowledge of the restrictive angling regulations through creel surveys. Esti	2	687	
6. Provide information acquired about bull trout to landowners and land management agencies within the McKenzie and Middle Fork Willamette basins and to other regional entities.	a. Compile data collected in this study and relate to habitat surveys completed by USFS and ODFW.	2	3,437	
	b. Provide quarterly and annual reports of operations and interim findings to BPA and other interested parties.	12	3,437	

	c. Publish the results and recommendations in a refereed journal or equivalent. Additional informational and technical presentations will be conducted as requested.	2	6,873	
	d. Coordinate and participate in bi-annual meetings of the Upper Willamette Bull Trout Working Group to coordinate field activities and exchange information.	2	686	
		Total	68,732	

Reviews and recommendations

This information was not provided on the original proposals, but was generated during the review processes.

ISRP Preliminary Review, ISRP 2002-2	**ISRP Recommendation:** Fundable only if response is adequate	**Date:** 3/1/2002	**Rec$:** N/A

Comment:

A response is needed. This work could provide useful information concerning strategies for reintroduction of bull trout and status and trends of bull trout in the Upper Willamette basin. However, the details of the research design, sampling protocols, and data analysis for the reintroduction study have not been adequately discussed. The sponsors need to justify why only 1-2 sites per experimental group are being considered for reintroduction. It would seem that if the results were to be generalizable over a wide area, as the sponsors suggest they would, and for greater statistical power more reintroduction sites for each experimental group would be needed. How will the authors determine how many fry and yearlings will be reintroduced at each site? Will there be an assessment of habitat carrying capacity of each reintroduction site? Will the researchers attempt to equalize numerical density or biomass between individual fry and yearling plants to help to control for density dependent effects? What will be done to assess the possible interactive effects of non-native fishes on bull trout? How often will the reintroduction sites be sampled annually and when? An important factor in determining relative success of reintroductions is habitat quality and quantity. Presumably habitat characteristics will not be identical between reintroduction sites. Is there going to be comprehensive assessment of habitat composition and utilization by reintroduced fish during the monitoring phase. If so, how will it be done and how will the information be used to evaluate reintroduction success.

Sponsor Response to the ISRP's Preliminary Review		**Date:** 3/15/2002	
CBFWA Review Comments	**CBFWA Recommendation:** High Priority	**Date:** 5/17/2002	**Rec$:** 159,400

Comment:

USFWS has identified that this project is a BiOp project. The proposed project will investigate strategies for reintroduction of bull trout and status and trends of bull trout in the Upper Willamette basin; however, CBFWA believes that the proposed experimental design and data analysis need to be explained in greater detail. Specifically, project sponsors should provide justification for number of release sites chosen and numbers and timing of fish transferred and released. In addition, CBFWA recommends that details of the methods and statistical analyses for Objective 3 need to be defined in greater detail.

ISRP Final Review, ISRP 2002-11	**ISRP Recommendation:** Do Not Fund	**Date:** 6/7/2002	**Rec$:** N/A

Comment:

Not fundable on a technical basis. The investigators explain well the constraints on sampling but do not provide adequate detail of their experimental/statistical design, an indication of the power they would have to detect differences between strategies given their constraints on numbers of fish and sites. If properly designed this work could provide useful information concerning strategies for reintroduction of bull trout and status and trends of bull trout in the Upper Willamette basin. In a revised proposal the ISRP suggests that it would be valuable to use excised fin tissues as a basis for a parentage analysis of the subject bull trout, for observing whether survival is random with respect to families, i.e. for observing the effective population size of bull trout.

BPA Review Comment	**BPA Rank:** C	**Date:** 7/23/2002	**RPA: no**

Comment:

Recommend deferring consideration of new ESA listed fish mitigation proposals in the Willamette Subbasin until issuance of the NMFS/USFWS BiOp for the Willamette Basin federal hydroprojects. It is questionable whether continued support of projects enabling fishing opportunities for ESA listed stocks is justified without a thorough review of the stock's status.

NWPPC Funding Recommendation	**NWPPC Recommendation:** Do Not Fund	**Date:** 10/30/2002	**Rec$:** 0

Comment:

Willamette Issue 2: Middle Fork Willamette Bull Trout Re-introduction and Basinwide Monitoring (Project 199405300)

Council Recommendation: The Oregon Department of Fish and Wildlife has been evaluating the status and trends of bull trout populations in the Willamette system for

several years. Although CBFWA designated this ongoing project as a High Priority, the ISRP rated it as "Do Not Fund", the only ongoing project in these provinces to receive that ISRP rating. Bonneville recommended "deferring consideration of new ESA listed fish mitigation proposals in the Willamette until issuance of the NOAA Fisheries/USFWS Biological Opinion for the Willamette." Though the project proposed new work in an expansion of the ongoing project, Bonneville's comments do not address the ongoing work associated with the project.

In the series of meetings staff conducted to review projects in these provinces, ODFW stated that they had addressed the ISRP concerns with the project by dropping the expanded tasks and new work that ISRP disliked and asked that staff recommend funding for the ongoing activities. The Council, however, finds no compelling evidence to confirm the sponsor's contention that ISRP supported the ongoing work. The Panel gave a Do Not Fund recommendation to the project, not a Fund in Part recommendation for the ongoing work. Without such a distinction and without a compelling policy justification to continue the ongoing work, the Council recommends not funding the project.

BPA Funding Decision: N/A

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