

HABITAT EVALUATION AND MONITORING  
IN THE COLUMBIA RIVER

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HABITAT EVALUATION AND MONITORING  
COLUMBIA RIVER BASIN  
PROJECT 86-78

I. INTRODUCTION

In December 1980 the "Pacific Northwest Electric Power Planning and Conservation Act" became law (PL. 96-501) after much debate and compromise among the constituents of the power production and fish and wildlife conservation communities. Among its objectives are "...the development of regional plans and programs related to energy conservation, renewable resources, other resources, and protecting, mitigating, and enhancing fish and wildlife resources."; and "...to protect, mitigate, and enhance the fish and wildlife, including related spawning grounds and habitat, of the Columbia River and its tributaries, particularly anadromous fish which are of significant importance to the social and economic well-being of the Pacific Northwest and the Nation...".

The law established the Northwest Power Planning Council (Council) charged with preparing and adopting "(A) a regional conservation and electric power plan, and (B) a program to protect, mitigate, and enhance fish and wildlife,..." These two basic purposes are generally agreed to have equal standing and importance, and the Council proceeded to solicit recommendations from state, Federal, tribal, and other entities for projects to mitigate for past losses to fish and wildlife from hydropower development or to enhance their present populations and habitat. Within two years the large number of projects submitted was developed into the "Columbia River Basin Fish and Wildlife Program". The act also provided that the Bonneville Power Administration (BPA) would fund and administer this program.

Under Measure 704(d)(1), Table 2 of the 1982 Program, BPA is funding numerous fish habitat and passage improvements in Oregon, Washington, and Idaho. The state of anadromous fish populations in the Columbia Basin in the early 1980's and the existing public sentiment for immediate positive action to restore the fish runs resulted in funding approval for some projects by fiscal year (FY) 1982. A rapidly increasing number of projects were implemented each fiscal year thereafter. Emphasis was placed on identification and implementation of projects. Time and resources available for planning, coordination, and evaluation of results were limited.

By late 1984 it became evident that the number and type of projects were rapidly escalating. Various governmental, private and tribal entities were executing a variety of projects designed to restore or enhance the habitat of salmon and steelhead in the Columbia basin. The results were being reported and analyzed in different formats using different methods and assumptions. It was becoming difficult to compare the results from both biologi-

cal and financial standpoints. Because of this situation Project 86-78 was initiated with the objective to review and analyze the work accomplished during FY 1982, 1983, and 1984 in relation to Measure 704(d)(1) Table 2, complete a summary report, and to recommend a format for reporting future work. The review and analysis included physical, biological, and financial aspects of each project.

## II. PROJECT LOCATION

The scope of work and projects that were reviewed are listed in Appendix A. The Appendix lists each project by a project number. Figure 1 shows the location of the projects by project number. The project numbers usually do not represent a specific location. The number is placed near the stream system where the work occurred. Some project numbers will appear more than once. These were situations where work in different areas may have been covered under the same project number.

## III. METHODS

Orientation - Prior to initiating detailed work on the project, a two day orientation meeting was attended. The meeting was conducted by the BPA Contract Officer's Technical Representative (COTR) and the Program Area Manager. The objective of the meeting was to discuss the historical aspects of the program in general, and some specific projects. In addition, a few of the project contract documents were reviewed to demonstrate the filing system and the location of documents.

The contractors also attended a Habitat Workshop in October 1986 to become more familiar with personnel, philosophies, and specific projects that BPA was administering.

Development of Standard Form - A standard form was developed to record information from each project (Appendix B). The data sources for completion of the form were the contract documents in the BPA offices and contractor reports to BPA for FY 1982, 1983, and 1984. Contract documents included a file for each project in the BPA Division of Fish and Wildlife and generally included work statements, original scopes of work, cost-to-date summaries, and contract modifications.

Another potential source of information was the individual project leader. Use of this source was not authorized until late in the project. At that point, it was determined the available time would be most efficiently spent in continuing to refine the analysis from the available document files.

The preparation of Standard Form 1 went through several changes. After we started reviewing reports and completing forms it became apparent that the contents of the project abstract would differ from project to project depending on the reviewer. At that point, a comments section was added to the project abstract to standardize our comments. A list of statements was included in



the comments section to focus responses on items that were unclear or needed explanation.

The next phase of the project was to prepare a summary form of the information in Standard Form 1 (Appendix C). The objectives were to provide a display of the information available for each project and the various assumptions that were made by each contractor, as well as, the basis for preparing a benefit to cost analysis, if one was done, for the predicted benefits.

#### IV. RESULTS AND DISCUSSION

The results of the study are presented in Appendices D and E. The following section of the report will be a general discussion of the findings.

The items considered important during review were: availability of project documentation, limiting factor analysis, habitat descriptions, fish production estimates, cost predictions, accounting at the project level, and benefit to cost analyses. These will be discussed separately.

Availability and Review of Project Documents - A major effort was required just to assemble the project documents for review. The effort was complicated by the confusion and overlap in contract agreement numbers and project numbers assigned to projects and sub-projects. This made the separation of project documents into distinct packages nearly impossible for some projects. In addition, most projects extended beyond fiscal year 1984, and were beyond the scope of work for this contract. Thus, all pertinent documents were not available for review.

During the course of the technical review we found that the documents were lacking various types of technical or economic detail that would be required to draw conclusions about the applicability of various efforts to provide a greater amount of habitat and thus potentially more fish. This was the basic reason that a comments section was added to the abstract: to focus our review on what we considered to be critical items in these types of studies. This has led to an initial critical review of the reports that suggests further analysis should be given to certain topics. However, the missing information may exist in other documents that we did not review or in the project contractors' files as unreported information. A further complicating factor was the reference to other documentation in the reports. Generally, this documentation was not available for review.

Limiting Factor Analysis - The assignment of a certain type of change(s) to a project area to increase production of fish requires an evaluation of the factors that affect the present population levels. These types of analyses are difficult, if even possible, to accomplish in most instances. There was a definite lack of this type of analysis in the reports that were reviewed. Although most reports referred to such factors either

directly or indirectly, there was little actual evidence for the statements and no detailed evaluation.

More consideration and analysis should be given to limiting factors prior to habitat modifications. The consideration should attempt to identify if the project area presently has low populations and if this is a historical condition or has only occurred recently. If it occurred due to factors that can be identified, then can habitat modification at this point in time make a change that would result in more fish. For example, if an area once had large numbers of steelhead but the present low levels are due to harvest in downstream areas, then instream habitat changes alone may not affect population size. But, if low numbers are due to factors such as water withdrawal, mine leaching, or riparian degradation, then modifications that attempt to correct these problems may help to restore populations. However, that assumes spawners would move into the area, hatchery supplementation would be supplied, or a program of trap and haul of adults to the area would occur to replenish the diminished population.

A standardized matrix analysis would help to focus thoughts to determine if all factors that could affect population levels in the project area have been considered. The analysis could be a generic list of factors that reviews the various life stages. The investigator would respond with specific answers that would help to focus the analysis and to enable a prediction of probability of success if certain modifications were undertaken.

Habitat Descriptions - The basic goal of all the projects is to alter the existing aquatic habitat to enable it to produce more anadromous fish. In order to determine if, or to what degree, the goal is met, it is necessary to quantify the habitat as it exists, to predict the changes the proposed work will bring about, and later to re-quantify the habitat resulting from the work accomplished. An analysis of the project documents should provide these data.

The information provided in this study was based on 41 projects of which 22 were in Oregon, 3 in Washington and 16 in Idaho (Table 1). Of this total, 16 (9 in Oregon, 1 in Washington, and 6 in Idaho) provided data to predict habitat changes. The remainder provided no quantification.

Habitat was considered in two categories: spawning and rearing. Seven projects reported predicted increases in both categories, 4 reported for rearing only and 4 reported for spawning only. This type of information was not included in the remaining projects.

Habitat quantification is essential if the relative contribution of the various types of stream enhancement measures is to be determined. These data in turn are desirable in planning for the best use of the available funds. Of the projects in this review, only 40 percent provided data on this basic parameter.

Table 1. Summary of type of prediction and benefit to cost prediction made by project contractor in available documents by subbasin.

SUBBASIN	NUMBER OF PROJECTS	NUMBER OF PROJECTS PREDICTING				BENEFIT: COST RATIO	PRESENT	PRESENT	BENEFIT: COST RATIO PREDICTED <sup>2</sup>
		HABITAT CHANGES	SMOLT CHANGES	ADULT CHANGES	DOLLAR BENEFITS		VALUE BENEFITS PREDICTED	VALUE COSTS PREDICTED <sup>1</sup>	
<b>Oregon:</b>									
Clackamas	1	1	1	0	0	0	--	--	--
Hood River	2	1	1	1	1	1	\$2,860,700	\$385,320	7.4:1
Deschutes	4	1	1	2	0	0	--	--	--
John Day	8	6	8	7	7	7	3,130,720	720,726	4.3:1
Umatilla	4	0	0	4	0	0	--	--	--
Grande Ronde	3	0	1	2	1	1	290,252	105,786	2.7:1
SUBTOTAL	22	9	12	16	9	9	\$6,281,672	\$1,211,832	5.2:1
<b>Washington:</b>									
Okanagan	1	1	1	1	1	1	\$9,165,225	\$9,917,000	0.9:1
Wenatchee	2	0	0	2	2	0	--	--	--
SUBTOTAL	3	1	1	3	3	1	\$9,165,225	\$9,917,000	0.9:1
<b>Idaho:</b>									
Clearwater	7	4	5	2	2	2	\$13,161,999	\$1,086,543	12.1:1
Salmon	9	2	3	5	4	4	19,187,550	17,953,725	1.1:1
SUBTOTAL	16	6	8	7	6	6	\$32,349,549	\$19,040,268	1.7:1
TOTAL	41	16	21	26	18	16	\$47,796,446	\$30,169,100	1.6:1

<sup>1</sup>Includes only costs used in benefit to cost calculations from project summaries.

<sup>2</sup>Assumptions used to derive present value of predicted benefits, costs, and benefit:cost ratios were not uniform across projects and, therefore, results cannot be directly compared among projects (see Appendix E). Also, the estimates derived by totaling different projects are probably not accurate.

Fish Production Estimates - To be technically or financially successful, habitat modification must do more than make the stream look better to the eye of the manager or consumer. Fish production must be increased above current levels. Productivity can be measured with varying degrees of difficulty at different life history stages of the target species. The number of anadromous juveniles that have reached the smolt stage at which they migrate from their rearing waters toward the ocean, may be the best measure for stream habitat projects. At this point the influence of the spawning and rearing habitat and any changes made to it is complete.

The prediction of change in number of smolts resulting from changes in habitat is basic to evaluating the success of the change. This requires knowledge of the densities prior to and after modifications. However, this type of basic information is lacking in many of the prediction sections of the reports. It may be available in other project files not available for this review.

The basis for the benefit to cost analysis depends on the estimation of change in number of adults after habitat modifications. These numbers were estimated in some projects. Of the 41 projects analyzed, 22 provided predictions of the anticipated increases in the number of smolts to be produced by the planned work, and 26 recorded their predictions for increases in returning adults. The basis for predictions of smolts was frequently vague or missing. The basis for adult returns was the smolt to adult survival rates that were subject to a considerable number of assumptions that were not well documented.

cost Accounting - Predicted costs associated with each project were separated into four phases: Planning/design, construction, evaluation, and operation/maintenance (Appendices D and E). For the majority of projects, planning and design work could only be identified if it were the only activity taking place during a fiscal year. Construction costs were generally itemized. However, if planning and design and construction work were conducted concurrently, the costs were listed separately for less than 30% of the projects. Evaluation costs appeared to be predicted separately for all projects for which they were incurred. Operation and maintenance costs were only addressed for 25% of all projects. These were generally projects in which several possible alternatives were predicted in detail by an engineering consultant.

A category labeled "contributed costs" was included in several project work statements. The actual relevance of these costs to the BPA funded work was neither discussed in detail in the work statements or reports nor included in the benefit to cost ratio calculations. The existence of contributed funds was suspected for several projects, but no evidence was available to allow definitive conclusions.

An attempt was made to categorize actual project expenditures into the work phases previously mentioned, as well as, by fiscal years. Expenditure records obtained from BPA project files contained insufficient detail to achieve these goals. Actual expenditure summaries could only be categorized for projects containing a single phase in a fiscal year or for which individual phases were allocated under separate project numbers. Some annual report summaries did provide itemization of expenditures into phases for fiscal years, but these were often compiled prior to final project invoices and, therefore, did not include all expenses.

Benefits Accounting - Monetary valuation of fish production benefits was completed by 16 of the 41 projects summarized (Table 1). The process used to achieve this valuation required several variables or assumptions. The basis for placing a monetary value on fisheries resources is generally the monies spent or received for sport or commercially captured fish. Therefore, the adult fish benefits predicted for a project must be divided into catch and escapement and then the catch further divided into the sport and commercial portions. The average value per fish by category can then be applied. Meyer (1982) used this process and derived a value per escaping fish based on the value of sport and commercial catch produced by that escaping fish. This value (\$359 for steelhead and \$550 for chinook) was used by 75% of the projects estimating benefits. Other values used included: Meyer (1984), ACOE (1985), Theurer, et.al., (1985) and the value of a recreational visitor day or fishing day. The resulting values used ranged from \$75 to \$214 for sport caught steelhead, \$106 to \$359 for escaping steelhead, and \$125 to \$295 for sport caught chinook. Values for other types of fish did not vary appreciably among projects.

The annual monetary value of fish benefits derived in this manner was then applied to a benefit to cost ratio calculation. Three major variables were evident in this process: timing of benefits occurrence, discount rate, and inclusion of relevant costs. For those projects estimating benefits, 70% began accruing benefits immediately after completion of construction. The remaining projects delayed the beginning of accrual to one or more life cycles of the target species. Benefits were accrued over 20 years for seven of the 16 applicable projects, 30 years for two projects, 50 years for five projects and 100 years for the remaining two projects. A discount rate of 4% was used fairly consistently among projects (80%). Rates of 3% and 7 7/8% were also used.

The third variable was relevant costs. These are expenditures which are applicable to or required to achieve a benefit. Inclusion of similar relevant costs was not consistent among projects where ratios were calculated. Some projects included costs from planning, construction, and maintenance phases of project work while others considered only construction costs as relevant. No projects which incurred contributed or evaluation costs included

those in the benefit to cost ratio. No justification for exclusion was provided.

Predicted benefit to cost ratios ranged from 0.07:1 to 70.5:1. The total discounted benefits predicted were approximately \$47,800,000 and total discounted costs were approximately \$30,200,000. This resulted in a predicted benefit to cost ratio for 16 projects of 1.6 to 1. However, the range in assumptions used by each project to derive a benefit to cost ratio, as discussed above, render an overall ratio highly suspect. If the assumptions were standardized for all projects the overall benefit to cost ratio could be completely different from that reported here. In addition, the inclusion of contributed funds may significantly affect the ratio.

Standardization of Reports - The reports had a wide variety of formats and content that ranged from generic to detailed research reports. The generic reports lacked sufficient information for our purposes and the research reports were very tedious to review because summaries pertinent for our purpose were not presented. Standardization of reports or at least a standard summary for each report would enable each contractor to focus results for each project so that BPA could determine if Program objectives were being met.

In some instances habitat modifications were split among many streams under the same contract number. If it is not feasible to separate each stream into a separate contract, then the contractors should be required to prepare their work statements and justification for funds in a standard format. The results of their studies could be separated by stream at the project contractor level. The use of the standard forms developed in this study would provide the necessary starting point for this effort. Although the separation may seem to take much time for the project managers, this would require them to provide details that could influence decisions on the value and applicability of the project. In addition, the work effort at the BPA level should be decreased because of similarity of documents and the ability to prepare summary documents from the contractors' reports.

The reports should also include a section on deviations from the proposed work in such a form that a direct comparison can be made to the original proposed work.

## V. Recommendations

The Bonneville Power Administration has spent a considerable amount of time and funds to plan and implement major programs to improve or increase habitat for fish populations. We have several recommendations that we think will help to focus the program so that the contractors for the projects will have a better understanding of the relative importance of their individual projects. In the long term, this should result in an elimination of excess project management and implementation costs.

However, in the short term, we think that an increased effort may be required to implement recommendations. This may require considerable inhouse (BPA) discussions among staff on the best way to proceed with the following recommendations:

Conceptual Analysis of Program - The specific objectives, action steps, and assumptions required to accomplish the objectives for each project and the interaction with other programs are difficult to determine from a review of the project reports. In other words, there appears to be a need for a document that presents an overview on how the projects relate to the overall program and what is expected, and what is required to accomplish expectations, at least conceptually, at the specific project level.

A review of the program should be made to present a holistic conceptual analysis. The general objective of the mitigation projects is to produce more fish. The primary action step that has been proposed to accomplish this is to modify the habitat. Other programs such as those for regulation of fishing, improvement of mainstem passage, and hatchery supplementation affect the attainment of these objectives. Other non-program activities, such as land-use activities, also may have significant affects. In order to clarify the intent and expectations for each project a more detailed description of the objectives and assumptions needed to attain those objectives is required.

This leads to some initial statements concerning a conceptual analysis:

1. The program objectives and expectations must be viewed from the perspective of their relationship to all non-program activities that could affect population levels of the target species. The analysis could delineate the overall objective8 of the habitat work, including how it is coordinated with other programs such as harvest management, the water budget, and mainstem passage. The analysis also would develop a statement regarding under-utilization of habitat and preservation of habitat and how these concepts affect the work efforts.

2. Most habitats in the Columbia River Basin are under-utilized either naturally or because of man's impacts. The under-utilized and those that are fully utilized should be identified.

3. To increase abundance in under-utilized habitats, the specific reason(s) for the under-utilization must be known.

4. Identification of factors responsible for low abundance in a project area requires a realistic and tedious review of the entire life cycle of the fish, not just the lifestage in the project area or of agency interest.

5. There is usually not a single factor, but multiple factors that cause under-utilization of habitats, and they may not all operate at the same time or occur in the project area.

6. Abundance should not be expected to increase with change8 in habitat in an under-utilized habitat, if the factor(s) affecting abundance have not been identified as operating in the project area.

A detailed basis for habitat modification should be provided not only for justification of funds or for decision-makers to choose certain project over others, but also to provide a basis for later evaluation effort8 to see if the objectives are being achieved.

In regard to the existing projects, the conceptual approach should be discussed with the contractors to attempt to focus analysis on the concepts. Then, the contractors could review their files for any pertinent information for ongoing or completed projects and update predicted and actual cost estimates and summary of work efforts through the 1984 fiscal year on the Standard Forms in Appendix D. In addition, the items in the comments section of the abstract8 in Appendix D could be clarified.

Limiting Factor Analysis - An analysis should be provided for each project to allow a presentation of all factors (over the entire life cycle of the target species) potentially affecting population levels in the area of interest (i.e., project area). The limiting factor analysis essentially would be performed in two steps: 1. Delineation of the limiting life stage(s), and 2. delineation of the factor(s) llmiting that life stage(e). The result of this analysis would then be used to determine possible prescriptions (A prescription is defined as one or more activities designed to increase, to some level, the number of spawning fish, adults, fry, juveniles, or smolts.) and their potential for success.

The analysis could be developed by providing a rigorous standard list of question8 for each contractor to address prior to implementation of any project. As an abbreviated example, the following could be prepared for each life stage of interest in the project area:

1. What is the target species:
2. What is the target life stage:
3. What are the current population levels (numbers):
4. What population levels (numbers) are desired:
5. What factors are limiting the abundance of the target life stage?

- 5(a).           What is the basis for your answer.
- 5(b).           What is the relative contribution (%) of each factor (opinion).
- 6.            What is your prescription to increase abundance of the target life stage.
  - 6(a)           Does this affect the limiting life stage as described in number 5, above?
- 7.            What is your estimated success (%) with implementation of the prescription?
  - 7(a).           What is the basis for your answer?

A series of questions relating to cost also should be developed.

For projects where implementation has already occurred, the questions still should be completed to clarify or modify expectations. Then a determination of which factors are responsible for present fish population levels (spawner, fry, juvenile, smolt, and/or adult) can be made. The determination usually will not be absolute, but the result would be a documented analysis that could be used to determine probability of increase in the number of fish in a life stage(s) with a series of action Step8 or a prescription. If habitat is not the limiting factor, then this information could be used in a more detailed analysis that included a comparison among projects to enable selection of projects for implementation. It also could be used to provide a basis for implementation of projects other than habitat modification projects that are necessary to increase number8 of fish.

This would allow development of a conceptual plan with details of present amount of habitat, potential limiting factor(s), proposed prescription to increase numbers of fish, and estimated number of the target life stage produced as a result. It would also allow the development of an evaluation program.

Fish Population Estimates - The techniques used to estimate the number of fish that would result from habitat modification8 included guesses, ins tream flow studies, semi-instream flow studies, and number of smolts per structure, as well as other numerically derived indices. An estimate of smolt per structure would be an ideal way to proceed but there appears to be little basis for using this method. A more quantitative method may be the use of the instream flow incremental methodology or some variation customized as a "quick and dirty" analysis. The application of this method is generally used and accepted, but more importantly provides a conceptual framework to consider the work. In addition, recent innovations have been made so that the program8 are available for microcomputers. The method would probably work well with modifications that change the hydraulic characteristics and affect habitat directly. Changes in riparian

habitat may affect hydraulic characteristics on a long-term basis but the effect on fish may be sooner.

However, the implementation of a single type of technique probably should be avoided. The objective of a technique is to accurately estimate abundance and species composition. The same technique does not necessarily have to be used for the whole program or even for the same project from year to year. Techniques should be considered simply as tools to achieve an objective and as progress is made, the techniques used may evolve or change.

Evaluation Process - An holistic and systematic approach is also required in the evaluation process. The identification of the limiting factors, and subsequent prescriptions will provide guidance as to the type of evaluation needed. The evaluation would be approached differently for fully utilized versus an under-utilized area. In a project area that is under-utilized, smolt production may not change as a result of habitat modification because habitat conditions probably would not limit population levels. An exception to this may be a change in habitat quality so that the depressed population of life stages currently using the degraded habitat could increase its percentage of survival.

In a fully utilized area, where instream habitat the limiting further increases in abundance, changes in abundance of the target species would be expected to occur with removal of limiting factors. The conclusion is that all factors affecting all life stages must be addressed to realistically evaluate and predict benefits from project work.

The evaluation process on a project whose population is determined by off project limiting factors can only evaluate the habitat change, not the population of life stage change. It can, however, provide a base pre-project population of the project area to document change in that area after the actual downstream limiting factor is corrected. This change (Increase) would be attributable in part to the downstream limiting factor correction and in part to the project habitat improvement factor.

A complicating factor in this type of allocation of change comparison is that the carrying capacity of the pre-project habitat would not be known. Thus, any Increases In abundance in a project area after application of a prescription in this type of situation cannot be attributed to changes in habitat per se.

The evaluation process usually has focused on the juvenile or smolt stage as the stage that has been numerically estimated. In order to estimate potential numbers of adults (or other life stages) that this equates to, it is necessary to make a series of site specific assumptions about survival rates for various life stages. The contractor should document this process for each life stage or phase as follows:

1. Species: \_\_\_\_\_
2. Target Life Stage: \_\_\_\_\_
3. Per Cent Survival
  - a) Egg to fry \_\_\_\_\_
  - b) Fry to juvenile \_\_\_\_\_
    - 1) Basis for estimate \_\_\_\_\_
  - c) Juvenile 1 to juvenile 2 \_\_\_\_\_
    - 1) Basis for estimate \_\_\_\_\_
  - d) Juvenile 2 to smolt \_\_\_\_\_
    - 1) Basis for estimate \_\_\_\_\_
  - e) Smolt to mouth of Columbia River \_\_\_\_\_
    - 1) Basis for estimate \_\_\_\_\_
  - f) Ocean life back to mouth of Columbia \_\_\_\_\_
    - 1) Basis for estimate \_\_\_\_\_
  - g) Columbia River to Project Site \_\_\_\_\_
    - 1) Basis for estimate \_\_\_\_\_
  - h) Number of eggs deposited per spawner \_\_\_\_\_
4. Overall survival rate from target life stage back to project site \_\_\_\_\_
5. Theoretical estimate of amount of change (numbers) of target life stage \_\_\_\_\_
  - a) What is the basis for this estimate \_\_\_\_\_
6. Theoretical contribution of this change in target life stage to numbers of adults at the project site \_\_\_\_\_
  - a) What is the basis for this estimate \_\_\_\_\_

benefit to Cost Analysis - The calculation of a monetary benefit to cost ratio is dependent upon estimating numbers of sport and commercially harvested fish. Thus, the target life stage for the monetary valuation necessarily is the adult stage. However, the evaluation process will focus on the life stage identified in the limiting factor analysis (spawning, fry, juvenile, smolt, or adult). Therefore, appropriate conversion factors should be developed and standardized to extrapolate from the other life stages to the adult stage for the benefit to cost ratio.

Benefits expected from habitat improvements may not occur at the level or timing predicted if the actual limiting factor(s) or life stage(s) were not affected. If the adult returns needed to provide full utilization of the new habitat would not be

available until some future date, then the occurrence of benefits used in the benefit to cost analysis must be delayed until that time. If this delay is expected to be greater than 10 years, the loss of benefit value due to discounting could severely affect the economic viability of performing the habitat work at the present time. It is also crucial to apply only those benefits which were relevant to the project work. Applying benefits to a project that were a result of other programs (such as harvest management or water budget) that alleviated limiting factors would be misleading.

A standardization of appropriate benefits timing, discounting techniques, and identification of relevant costs would also be required to facilitate comparison among projects. The role of contributed funds also should be examined. These funds could make up a considerable portion and significantly affect the cost accounting.

Standardization of Reports - Reports should be standardized, including units of measure to be used. Each contractor should be required to have a standard summary form and a detailed analysis documenting all assumptions and the basis for estimating predicted changes in habitat and fish production for each stream or stream segment, if applicable.

#### VI. REFERENCES CITED

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## APPENDIX A

PROJECT 86-78

HABITAT EVALUATION AND MONITORING/COLUMBIA RIVER BASIN

**STATEMENT OF WORK**

Part A - General

A. 1. Goal of this Contract

The objective of this project is to review and analyze reported information on BPA-funded habitat and passage improvement work done during fiscal year (FY) 1982 through 1984, devise a format for summarizing it, and complete a summary report. Attention shall focus on the fishery benefits; methods for prediction; comparison of project accomplishments in relation to Program Measure 704(d)(1), Table 2; and BPA costs for implementation of each project. This report will be used to recommend a format for reporting future work and will delineate data deficiencies that need to be corrected to facilitate monitoring, evaluation, and guidance of BPA's habitat and passage improvement program.

A. 2. Background

BPA is funding numerous habitat and passage improvement projects in Oregon, Washington, and Idaho to fulfill Measure 704(d)(1) of the Columbia River Basin fish and Wildlife Program (as amended October 1984). The results of these habitat and passage improvement projects have been reported by the State and federal agencies, Indian Tribes, and private contractors who have conducted the projects from FY 1982 through FY 1985. As would be expected with such a new and complex program, methods of assessing Pre-project biological conditions, measuring benefits, and reporting results have differed among the contractors. BPA has initiated this contract to provide a summary report of these projects that provides readily accessible documentation, summarization of the fish benefits and an evaluation of cost effectiveness.

A. 4. Location of Project

The Contractor shall be provided all information from the BPA Headquarters, 1002 N.E. Holladay, Portland, Oregon. No field inspections of projects shall be required for the FY 1982 through FY 1984 report.

A. 5. Government Furnished Property or Services

BPA will provide the Contractor with a copy of all available and applicable annual and final reports submitted to BPA by habitat and passage improvement project contractors. These documents will be

available for delivery to the Contractor at the Division of Fish and Wildlife, BPA Headquarters, 1002 N.E. Holladay, Portland, Oregon, on the effective date of the contract, or, at the Contractor's option, EPA will mail copies of the documents to the Contractor within 10 days following the effective date of the contract. BPA will provide a summary of the cost information for each project.

#### A.6, Contractor Furnished Property or Services

The Contractor is required to provide all property and services in support of this contract, except those mentioned under A.5. above.

#### Part B Technical Approach/Tasks

##### 8.1. General Requirements

The Contractor shall be required to review and summarize information in annual and final reports for BPA habitat and passage improvement projects; complete a cost/evaluation of on going and completed physical habitat and passage improvements (1982 - 1984); compare project accomplishments in relation to Program Measure 704(d) (1), Table 2; and prepare a summary report to BPA. The Contractor will be able to consult with BPA and project leaders to obtain additional information not contained in annual and final reports.

##### 8.2. Specific Requirements

###### Task 1. Project Review and Summary

Subtask A. Review annual and final reports, as applicable, for the following BPA funded habitat and passage improvement projects from 'FY 1982, FY 1983, and FY 1984:

###### 1) Oregon

###### Willamette/Clackamas River Subbasin

84-11 Clackamas/Hood River Habitat Enhancement, including subprojects:

- a) Collawash River Falls Passage Feasibility
- b) Collawash River Drainage Habitat Improvement
- c) West Fork/Hood River Passage Improvement
- d) Fish/Wash Creek Habitat Improvement
- e) Lower Oak Grove Fork Habitat Improvement

Hood River Subbasin

83-341 West Fork Hood River Passage

Deschutes River Subbasin

81-108 Habitat Quality and Anadromous Fish Production Potentials on the Warm Springs Indian Reservation

83-423 Trout Creek Riparian Enhancement

83-450 White River Falls Passage

John Day River Subbasin

84-8 N. Fork John Day River Habitat Enhancement, including subprojects;

- a) Desolation Creek .
- b) N, Fork John Day River Habitat Improvement
- c) Clear/Granite Creeks

84-21 Mainstem, Middle Fork/John Day River, including subprojects:

- a) Mainstem John Day River
- b) Middle Fork John Day River
- c) North Fork John Day River

84-22 Mainstem and Upper John Day River, including subprojects:

- a) Upper Mainstem John Day River Habitat Improvement
- b) Big Boulder Creek
- c) Granite Boulder Creek
- d) East Fork Beech Creek
- e) Canyon Creek

83-384 Murderers/Deer Creek Fish Habitat

83-473 Cottonwood Creek Habitat Improvement

82-9 Deer Creek  
Clear Creek  
Camp Creek

Umatilla River Subbasin

83-10 Plan for Restoring Salmon and Steelhead in the Umatilla River

83-434 Umatilla River Channel Study

83-436 Three Mile Dam Passage Study

83-834 Lower Umatilla River Channel Modification8 below Three Mile Dam

Grande Ronde River

84-9 Grands Ronde tlabitat Improvement Project, including subprojects:

Upper Grande Ronde Subbasin:

- a) Joseph Creek
- b) Elk Creek
- c) Swamp Creek
- d) Chesnimnus Creek
- e) Sheep Creek

84-25 Grande Ronde River Habitat subprojects:

- a) Upper Grands Roads River
- b) Joseph Creek
- c) Elk Creek

83-392 Peavine Creek Spawning Habitat

2) Washington

Similkameen River Subbasin

83-477 Enloe Dam Passage

Wenatchee River Subbasin

83-446 Tumwater/Dryden Passage

3) Idaho

Clearwater diver Subbasio

84-3 1 Clearwater Basin Agreement, Habitat Improvement subprojects:

- a) South Fork Clearwater River
- b) Habitat Enhancement for Clearwater and Lochsa River Tributaries

84-5 South Fork Clearwater River subprojects:

- a) Red River
- b) Crooked River Passage and Habitat

84-6 Clearwater River Habitat

Enhancement Improvements, including subprojects:

- a) Lo10 Creek
- b) Eldorado Creek
- c) Crooked Fork Creek

Salmon River Subbasin

83-7 Idaho Habitat subprojects:

- a) Boulder Creek Passage
- b) South Fork Salmon River Passage

83-416 Pole Creek Irrigation Diversion Screening

83-23 Camas Creek, Idaho

83-359 Salmon River Habitat subprojects:

- a) Bear Valley Creek
- b) Yankee Fork/Jordan Creek
- c) East Fork Salmon River

83-415 Alturas Lake Creek and Upper Salmon River Flow Augmentation

84-24 Marsh/Elk/Bear Valley/Upper Salmon River

84-28 Lemhi River

84-29 Panther Creek

Subtask B For each project or subproject listed under Task 1, Subtask A, summarize information in the FY 1982 through FY 1984 annual and final project reports, using a standardized format. If necessary, consult with individual project leaders to clarify existing information or gather additional information. A summary of all information in each of the following categories is required:

- 1) Pre-project fish benefit prediction;
- 2) Species of anadromous salmonids to be enhanced (target species);

- 3) Planned physical habitat and/or passage improvements;
- 4) Status/present phase of the project (eg. planning, design, implementation) ;
- 5) Predicted smolt abundance of each target species following implementation of habitat and/or passage improvements;
- 6) Actual smolt production of each target species following implementation of habitat and/or passage improvements (if improvements have been completed); and
- 7) an off-rite mitigation record for Section 704 (d)(1).

#### Task 2 Evaluation of Project Cost Effectiveness

Subtask A Each project contain8 information on predicted fishery benefits, budgets and some benefit/cost analysis. The contractor shall summarize this informaton and then evaluate the cost effectiveness of each project relative to the fishery benefits.

Subtask B Compare actual BPA expenditure8 for each *project* to predicted fish benefit to actual fish benefit, and evaluate project cost effectiveness. Recommend measures to eliminate excess project management and implementation costs.

#### Task 3. . Summary Report

Complete a **summary** report addressing results of Tasks 1 and 2 and associated subtasks. Information for each project or rubproject Shall be assembled in a common format and organized by state and river subbasin within states. Each project or subproject shall be identified by BPA project *number*, complete title, BPA contract number, contractor, and contractor's project leader. As an appendix to the summary report, include a concise one-page **summary** for each project, which condenses information in the main body of the report.

#### Task 4. Coordination/Consultation

During the contract period, the Contractor shall meet with BPA to provide coordination and consultation on project activities. BPA anticipates that up to five meetings will be required. The meetings will be held in Portland, Oregon. Three of the meeting8 are scheduled in Item B S. Time Schedule. up to two additional meetings may be held at the request of BPA. BPA will provide at least 10 days notice to the Contractor prior to the meeting. The Contractor may also consult with individual project leader8 to obtain additional information.

#### Task 5. Report Writing/Completion Schedule

The Summary Report required in Task 3 shall be prepared and submitted to BPA within 120 days of the contract award. Prior to submittal of the final report, the Contractor shall prepare and submit five Copies of a draft Summary Report to BPA for formal review and comments. The Contractor shall give these comments full consideration and make necessary revisions when completing the final Summary Report. A detailed completion schedule, by task shall be provided by the contractor to ensure compliance within the contract period. The Contractor Shall submit monthly progress reports to BPA.

#### B.4 Deliverables

1. Draft of the Summary Report required under Task 3 in Technical Approach of the Work Statement (5 copies).
2. Final Summary Report required under Task 3 in the Technical Approach of the Work Statement (5 copies).
3. Monthly progress reports, issued no later than 15 days after the end of the month. These reports shall be submitted to the COTR and shall include :
  - a) A summary of significant results or activities (if any).
  - b) A brief discussion of any major problems encountered, changes in work plan, or schedule deviations.
  - c) A short description of planned activities for the following month.

#### B.5 Time Schedule

1. Orientation meeting (3 days) at BPA to initiate the project 15 working days after award.
2. Submit a draft Summary Report to BPA -- 90 working days after award.
3. Meet with BPA to review comments on the draft Summary Report -- 100 working days after award.
4. Submit the final Summary Report to BPA -- 120 working days after award.
5. Present a summary of the results contained in the final Summary Report at a meeting with BPA -- 120 days after award.

## APPENDIX B

CONTRACT NUMBER:  
 PROJECT NUMBER:  
 PROJECT NAME:  
 SUBBASIN NAME:  
 LOCATION: STATE:  
 TYPE OF PROJECT:

RELATED PROJECT NUMBERS:  
 STREAM(S):  
 TARGET SPECIES:  
 COUNTY:

INSTREAM \_\_\_\_ PASSAGE \_\_\_\_ PONDS \_\_\_\_  
 SIDE CHANNEL \_\_\_\_ RIPARIAN \_\_\_\_

PUBLISHED IN:

CONTRACTOR:

TYPE: FEDERAL \_\_\_\_ STATE \_\_\_\_ TRIBE \_\_\_\_ PRIVATE \_\_\_\_

PROJ. LEADER:

SUBBASIN NUMBER:

EPA STREAM SEG./MILE CODE: \_\_\_\_\_

STREAM ORDER:

BEGINNING DATE:

COMPLETION DATE:

PRESENT STATUS:

PROJECT LIFE (YEARS):

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAUNING AREA (SQ. YD.)	_____	_____	_____	_____	_____	_____
REARING AREA (SQ. YD.)	_____	_____	_____	_____	_____	_____
TOTAL USABLE AREA (SQ. YD.)	_____	_____	_____	_____	_____	_____
STREAM LENGTH (MILES)	_____	_____	_____	_____	_____	_____
POOL/RIFLE RATIO	_____	_____	_____	_____	_____	_____
PONDS (NO. & TOTAL ACREAGE)	_____	_____	_____	_____	_____	_____
SIDE CHANNELS (SQ. YD.)	_____	_____	_____	_____	_____	_____
RIPARIAN	_____	_____	_____	_____	_____	_____
AREA (ACRES)	_____	_____	_____	_____	_____	_____
STREAM LENGTH (MILES)	_____	_____	_____	_____	_____	_____
DOWNSTREAM IMPACT (MILES)	_____	_____	_____	_____	_____	_____
WATER TEMP. (DEG. C.)	_____	_____	_____	_____	_____	_____
SEDIMENT	_____	_____	_____	_____	_____	_____

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
JUVENILE:	_____	_____	_____	_____	_____	_____
SMOLT:	_____	_____	_____	_____	_____	_____
ADULT:	_____	_____	_____	_____	_____	_____

\* SEE ATTACHED STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

B3



## SUMMARY

### 1. Abstract

### 2. Comments

#### A. Availability of Documents

1. Were all documents available for review

#### B. Habitat

1. Were limiting factors discussed in detail
2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat
3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

#### C. Fish

1. Were the target species clearly identified
2. Were predictions of change in numbers of each target species based on quantified changes in habitat
3. If the predicted change in numbers of fish were based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult
4. Was hatchery supplementation discussed

D. Economic

1. Were all project costs included in documents
  - a. Planning/Design
  - b. Construction
  - c. Evaluation
  - d. Operation & Maintenance
  - e. Other Contributed Fund6
2. What was the dollar value of the target species based on
3. was the time when the benefits would start determined
4. Was the effective life of the project clearly stated

## APPENDIX C

Appendix C. Summary Form of Predicted Habitat, Fish Benefits, Value of Benefits, Costs, and Discounted Benefit to Cost Ratio with Variables Used for Each Project for Oregon and Washington.

PROJECT NAME	HABITAT CHANGE (SQ. YD.)		NUMBER	TOTAL	% SURV.	TOTAL	CATCH:	ADULT CHANGE (NO.)		
	REARING	SPAUNING	SMOLTS PER HAB. UNIT	SMOLT CHANGE (NO.)	SMOLT TO ADULT	ADULT CHANGE (NO.)	ESCAPE.	ESCAPE.	SPORT	COMM.
<b>OREGON</b>										
Mt. Hood										
84-11 : Upper Lake Branch : Fish/Wash Cr.										
83-341: West Fork Hood R. Deschutes River										
81S-8 : Warm Springs : Beaver Cr.										
83-423: Trout Cr.										
83-450: White R. John Day River										
84-8 : N.F. John Day R. : Clear & Granite Cr.										
82-9 : Deer Cr. : Camp Cr.										
84-21 : John Day R.										
84-22 : E.F. Beech/Canyon Cr.										
83-384: Murderers & Deer Cr.										
83-473: Cottonwood Cr. Umatilla River										
84-10 : Comprehensive Plan										
83-434: Lower Umatilla R.										
83-834: Lower Umatilla R.										
83-436: Umatilla R. 3 mi Dam Grande Ronde										
84-9 : Grande Ronde -Elk (USFS land) & Sheep Cr.										
84-25 : Elk Cr.(ODFU Contract)										
83-392: Peavine Cr.										
<b>WASHINGTON</b>										
83-477: Enloe Dam : Similkameen R.										
83-446: Tumwater Falls										
: Dryden Dam										



## APPENDIX D

TABLE OF CONTENTS FOR APPENDIX D

OREGON

Willamette/Clackamas River Subbasin

- 84-11 Clackamas/Hood River
- 84-11b Clackamas/Hood River
- 84-11c Clackamas/Hood River
- 84-11d Clackamas/Hood River

Hood River Subbasin

- 83-341 Hood River Passage

Deschutes River Subbasin

- 81s-8 Warm Springs Habitat/Production-Potential Assessment
- 81S-8b Warm Springs Habitat/Production Potential Assessment
- 82s-8c Warm Springs Habitat/Production Potential Assessment
- 83-423 Trout Creek Natural Propagation Enhancement
- 83-440 White River Falls Passage

John Day River Subbasin

- 82-9 John Day River Habitat Improvement
- 83-384 Murderers Creek/Deer Creek Fish Habitat
- 83-395 North Fork John Day Habitat Improvement
- 83-473 Cottonwood Creek Habitat Improvement
- 84-8 North Fork John Day Habitat Improvement
- 84-8b North Fork John Day Habitat Improvement
- 84-21 Mainstem, Middle Fork, John Day River
- 84-22 Mainstem and Upper John Day River
- 84-22b Mainstem and Upper John Day River

Umatilla Subbasin ,

- 83-434 Umatilla River Channel Modification
- 83-436 Three Mile Dam Passage
- 83-834b Lower Umatilla Channel Modifications Assessment
- 84-10 Umatilla Basin Salmon/Steelhead Restoration Plan

Grande Ronde Subbasin

- 83-392 Peavine Creek Spawning Habitat Improvement
- 84-9 Grande Ronde Habitat Enhancement (USFS)
- 84-9b Grande Ronde Habitat Enhancement (USFS)
- 84-25 Grande Ronde Habitat Enhancement (ODFW)

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WASHINGTON

Okanogan River Subbasin  
83-477 Enloe Dam Passage

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83-446 Tumwater/Dryden Passage  
83-446b Tumwater/Dryden Passage

IDAHO`

Clearwater River Subbasin  
82-L Inventory of Nez Perce Reservation Streams  
83-501 Red River Fish Habitat Improvement  
84-5 Red River/Crooked River Habitat/Passage Improvements  
84-6b Lolo/Crooked Fork/El Dorado Creek Improvements  
84-6c Lolo/Crooked Fork/El Dorado Creek Improvements  
84-6d Lolo/Crooked Fork/El Dorado Creek Improvements  
84-3 1 Clearwater Basin Agreement, Habitat Improvement

Salmon River Subbasin  
83-7 Idaho Habitat Evaluation/Offsite Mitigate Record  
83-7b Idaho Habitat Evaluation/Offsite Mitigate Record  
83-359 Bear Valley Creek Habitat Improvement  
83-4 15 Alturas Lake Creek Flow Augmentation  
83-416 Pole Creek Irrigation Diversion Screening  
84-23 Camas Creek Habitat Enhancement  
84-24 Marsh/Elk/Upper Salmon River, Idaho  
84-28 Lemhi River Rehabilitation, Idaho  
84-29 Panther Creek, Idaho Habitat Rehabilitation

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AC79-84BP11902  
 PROJECT NUMBER: 83-477  
 PROJECT NAME: Enloe Dam Passage  
 SUBBASIN NAME: Okanogan River  
 LOCATION: STATE: Washington  
 TYPE OF PROJECT: INSTREAM \_\_\_\_\_ PASSAGE X PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_

RELATED PROJECT NUMBERS:  
 STREAM(S): Similkameen River  
 TARGET SPECIES: summer steelhead (Wells Hatchery)  
 COUNTY:

PUBLISHED IN: Natural propagation and habitat improvement Volume IIB - Washington: Similkameen River habitat inventory. (1983 (April 1984). Final Report natural propagation and habitat improvement Washington: Enloe Dam fish passage project. Annual Report 1983 (June 1985)

CONTRACTOR: Beak Consultants TYPE: FEDERAL \_\_\_\_\_ STATE \_\_\_\_\_ TRIBE \_\_\_\_\_ PRIVATE X  
 PROJ. LEADER: Len Fanning  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS): 50

05

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	<u>1,150,000</u>	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	<u>.837 to 2.2 million (steelhead Only)</u>	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	<u>40-100</u>	-----	-----	-----
POOL/RIFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*			
SMOLT:	summer steelhead	-----	-----	<u>610,000</u>	-----
	chinook salmon	-----	-----	<u>1.6 to 4.8 million</u>	-----
ADULT:	summer steelhead	-----	-----	<u>9,700-24,000</u>	-----
	chinook salmon	-----	-----	<u>no estimate</u>	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AC79-84BP11902  
 PROJECT NUMBER: 83-477  
 PROJECT NAME: Enloe Dam Passage  
 SUBBASIN NAME: Okanogan River TARGET SPECIES: summer steelhead (Wells Hatchery)  
 LOCATION: STATE: Washington COUNTY:  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS): 50

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN. <sup>2</sup>	CONST. <sup>2</sup>	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984	\$752,279	\$1,935,000									\$66,000	
1985												
1986												
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	\$752,279	\$1,935,000										

D6

<sup>1</sup>Contributed Funds

<sup>2</sup> This may not be cost to date; it is the contract cost for modification A006.  
 The actual cost was not in the file.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 3

YEARS OCCURRING	BENEFITS	PREDICTED <sup>3</sup>		ACTUAL	
		DISCOUNTED BENEFITS	DISCOUNTED COSTS	DISCOUNTED BENEFITS	DISCOUNTED COSTS
10% harvest 0-50		7,215,000	9,917,000		
20% harvest 0-50		9,156,225	9,917,000		
40% harvest 0-50		11,445,335	9,917,000		
=====		=====	=====	=====	=====
TOTAL		9,156,225	9,917,000	TOTAL	

DISCOUNTED BENEFITS : DISCOUNTED COSTS 0.92<sup>4</sup>

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

<sup>3</sup>Alternative 4 used for illustration

<sup>4</sup>Based on 20% harvest

## SUMMARY

### 1. Abstract

Phase I of the project was a habitat survey of the Similkameen River system upstream from Enloe Dam. The objective was to evaluate the biological, physical, and chemical parameters if species were introduced. Anadromous fish apparently have not had access to the area above Enloe Dam because of the barrier falls just upstream. The study inventoried fish populations, habitat, hydrology, water quality, and estimated potential spawning and rearing area for steelhead and chinook salmon. Estimates of the capacity of the system to produce steelhead smolt were about 609,600 smolt per year. Using average smolt to adult survival rates of 1.5 and 4.0%, between 9,100 and 24,000 adult fish would return. The source of steelhead would be the Wells Dam stock. Although chinook were discussed in phase I, they were not considered a target species in phase II.

Phase II of the project was development of a fisheries enhancement plan, conceptual design of passage alternatives, and NEPA assessment of passage alternatives. Six alternatives were made to provide upstream passage at Enloe Dam. The capital cost range from about \$1.5 million to \$3.6 million for the various alternatives, but the dam removal alternative would cost about \$27.4 million. Operation and maintenance costs were estimated for each alternative and the cost of outplanting and rearing for summer steelhead at Wells Dam Hatchery were estimated. Benefit/cost ratios were estimated for each of the alternatives assuming harvest levels of 10, 20, and 40%, supplementation of smolts from Wells Hatchery, a project life of 50 years and the total project costs for each alternative. These ratios ranged from 0.73 to 1.97.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

No. An appendix (Volume II) for the Similkameen River Habitat Inventory was not available. This appendix apparently included the analysis for a semi-instream flow study that was used to estimate habitat. This should be reviewed.

B. Habitat

1. Were limiting factors discussed in detail

Limiting factors upstream of Enloe dam were not discussed in detail, but steel head rearing habitat was probably limiting. The estimated spawning/rearing habitat based on a semi-instream flow study should be further considered because increased rearing areas may need to be provided through habitat modification.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Yes, but the analysis was not available for review (See: 2A1 above.)

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes, but the estimates appear to be high.

C. Fish

1. Were the target species clearly identified

Yes: Steel head and chinook. Apparently, anadromous fish have not previously used the basin.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Yes, but the semi-instream flow data and analysis were not available for review. Also, the suitability curves for the analyses were not available. The application of the curves and the hydraulic modeling and the subsequent estimate of habitat for each life stage should be reviewed. Also, low densities of rainbow trout were attributed to fishing pressure, but habitat/food conditions should be evaluated, and considered relative to introduction or steelhead.

3. If the predicted change in numbers of fish was based on adults. were the survival rates clearly stated for conversion from smolt or juvenile to adult

Yes. Documentation and assumptions were probably adequate, but the Slaney method for steelhead smolt estimation is dependent on adequate estimates of amount of different types of habitat and the numbers of parr that can be supported. Also, the chinook **smolts/m<sup>2</sup>** were based on values that have wide ranges. In view of the low densities of rainbow trout, the estimates of steelhead and chinook should be re-evaluated.

4. Was hatchery supplementation discussed

Yes. The Wells stock of summer steelhead would be introduced. No mention was made of chinook sources. The smolt to adult survival for steel head (1.5 - 4.0%) may be high for returns to the Similkameen River and its tributaries. Also, hatchery smolts were estimated at 250,000 per year to achieve an escapement of 15,500 fish in years 19-24, and natural spawning would be responsible for 71X of the returning adults. The projections depend on various assumptions.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes.
- c. Evaluation - **No** evaluation costs were estimated.
- d. Operation & Maintenance - Included as annual costs of labor and maintenance.
- e. Other Contributed Funds - The U.S. Bureau of Reclamation has committed \$425,000 for expansion of Wells Hatchery, 125,000 per year for O+M of the expansion and outplanting, and \$65,000 for a fish truck. These costs were included in alternative costs.

Disbenefits were estimated. These were costs due to the loss of power production by the PUD that were associated with two alternatives. The disbenefits were \$2,467,000 and 3,259,000 for alternatives 4 and 2 respectively.

2. What was the dollar value of the target Species based on

Meyer (1984) values were used.

Adult steelhead, sport caught - \$144.000  
Adult steelhead, commercial/Indian - 121.81

A broad stock of 115 fish were removed from the B/C analysis and were assumed to have no economic value

3. Was the time when the benefits would start determined

Benefits were to start in project years 1-6.

4. Was the effective life of the project clearly stated

No.

D10

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AC-79-83BP12756 - DRYDEN DAM  
 PROJECT NUMBER: 83-446 RELATED PROJECT NUMBERS:  
 PROJECT NAME: Tumwater Falls & Dryden Dam Fish Passage Projects  
 STREAM(S): Wenatchee River  
 SUBBASIN NAME: Wenatchee River TARGET SPECIES: spring chinook, summer chinook, steelhead  
 LOCATION: STATE: Washington COUNTY: Chelan  
 TYPE OF PROJECT: INSTREAM      PASSAGE X PONDS       
                   SIDE CHANNEL      RIPARIAN       
 PUBLISHED IN: Natural propagation and habitat improvement Volume IIA - Washington:  
                   Tumwater and Dryden Dam fish passage. Final Report 1983 (April 1984).  
 CONTRACTOR: Ott Water Engineers TYPE: FEDERAL      STATE      TRIBE      PRIVATE X  
 PROJ. LEADER: Dennis Dorratcague  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS: On Hold  
 PROJECT LIFE (YEARS): 20

D11

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

ADULT:	SPECIES	CODE*			
	spring chinook	-----	-----	-----	136-272 <sup>1</sup>
	summer chinook	-----	-----	-----	300-600 <sup>1</sup>
	steelhead trout	-----	-----	-----	300

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS  
<sup>1</sup> Range of estimates based on estimated existing impairment.

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AC-79-83BP12756 - Dryden Dam  
 PROJECT NUMBER: 83-446  
 PROJECT NAME: Tumwater Falls & Dryden Dam Fish Passage Projects  
 SUBBASIN NAME: Wenatchee River TARGET SPECIES: spring chinook, summer chinook, and steelhead  
 LOCATION: STATE: Washington COUNTY: Chelan  
 TYPE OF PROJECT: INSTREAM PASSAGE X PONDS —  
 SIDE CHANNEL — RIPARIAN —

BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS: On Hold  
 PROJECT LIFE (YEARS): 20

F Y	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983	\$32,565 <sup>a</sup>						632,565					
1984	31,273 <sup>a</sup>			\$59,747 <sup>a</sup>			31,273	\$59,747 <sup>a</sup>				
1985		1946,000					946,000					
1986												
OTHER												
<b>TOTAL</b>	164,738	\$946,000	\$59,747			\$1,009,838						

<sup>a</sup>Contributed Funds  
 "This is 1/2 of the total costs, listed for both Dryden Dam and Tumwater Falls

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) —										
YEARS OCCURRING		PREDICTED DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS		YEARS OCCURRING		ACTUAL DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
=====		=====	=====	=====		=====		=====	=====	=====
TOTAL				TOTAL		TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_ DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

## SUMMARY

### Abstract

Dryden Dam was built in the early 1900's as a diversion for irrigation and hydropower. The hydropower generation has been abandoned. The present fishway facilities are inadequate to properly pass anadromous fish. This report was an engineering feasibility and pre-design report intended to evaluate ways to increase the efficiency of passage. It also included an environmental review for NEPA compliance. The report contained a chapter titled "analysis of expected benefits" where the authors attempt quantification of losses attributable to the existing situation. These losses were presumed to be benefits if the fishway was rehabilitated. Cost was computed based on the number of steel head, spring chinook, and summer chinook gained and the cost per fish based on Meyer (1982).

### Comments

#### A. Availability of Documents

1. Were all documents available for review

Yes.

#### B. Habitat

1. Were limiting factors discussed in detail

The conditions of the existing structures were considered problems. However, the authors stated that the data were not sufficient to perform a "rigorous and precise assessment of actual impairment of passage or reproductive success directly attributable to each of the two dams." In addition, a comment attributed to James Mullen, USFWS, appears to discount the threat of the Dryden and Tumwater projects (See pages 9-15 of the report).

2. Was the ore-oroiect amount of habitat quantified in terms of spawning or rearing habitat

A habitat discussion was not presented. It could be pertinent to limiting factors in the basin other than the project. In addition, if run size is increased, sufficient habitat may not be available to accomodate the increased fish numbers.

- 3 Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

C. Fish

1. Were the target species clearly identified

Spring and summer chinook, sockeye, and steelhead were discussed in terms of stocks present. However, benefits were not discussed for sockeye.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No. This was not applicable (N/A).

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

N/A

4. Was hatchery supplementation discussed

No, the run would build naturally.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes.
- c. Evaluation No evaluation costs were estimated
- d. Operation & Maintenance - No. This would be provided by Chelan County PUD.
- e. Other Contributed Funds - None listed by Chelan county. PUD would provide O+M.

2. What was the dollar value of the target species based on

Meyer (1982) report for escaped spawners

Spring and summer chinook salmon - \$500

Sockeye salmon - \$18

Steelhead - \$359, but a value of \$270 was used.

3. Was the time when the benefits would start determined

No. A projection of benefits was not provided.

4. Was the effective life of the project clearly stated

No, it was not provided.



SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AC-79-83BP12756 - TUMWATER FALLS  
 PROJECT NUMBER: 83-446  
 PROJECT NAME: Tumwater Falls and Dryden Dam Fish Passage Project  
 SUBBASIN NAME: Wenatchee River TARGET SPECIES:  
 LOCATION: STATE: Washington COUNTY:  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN   
 BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D17

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983	\$32,565 <sup>2</sup>						\$32,565					
1984	31,273 <sup>2</sup>			\$59,747 <sup>2</sup>			31,273	\$59,747 <sup>2</sup>				
1985		\$933,000					933,000					
1986												
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	\$64,738	\$933,000		\$59,747			\$997,738	\$59,747				

<sup>1</sup>Contributed Funds

<sup>2</sup>This is 1/2 the total cost listed for both Tumwater Falls and Dryden Dam.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%)

YEARS OCCURRING	PREDICTED DISCOUNTED BENEFITS	PREDICTED DISCOUNTED COSTS	ACTUAL DISCOUNTED BENEFITS	ACTUAL DISCOUNTED COSTS
=====	=====	=====	=====	=====
TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS

DISCOUNTED BENEFITS : DISCOUNTED COSTS

## SUMMARY

### 1. Abstract

Tumwater Falls Dam was built in the early 1900's as a diversion for hydropower. Hydropower is no longer produced. The present fishway facilities are inadequate to properly pass anadromous fish runs. The purpose of this report was to prepare predesign and engineering concepts that would address fishway schemes capable of adequately passing present and projected fish runs. The report contains a chapter titled "analysis of Expected Benefits" where the authors attempt quantification of losses attributable to the existing situation. These losses were presumed to be benefits if the fishway is rehabilitated and a cost is compiled. The cost per spring chinook, summer chinook, or steelhead trout based on Meyer (1982) was applied to the number of fish lost and an estimated annual economic benefit was computed.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

Yes.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

The condition of the existing structures were considered problems to fish passage, but the data were insufficient for a detailed review of impairment of fish passage due to the project. In addition, a comment attributed to James Mullen, USFWS, appears to discount the threat of the Tumwater and Dryden projects (See pages 9-15 of the report I.

##### 2. Was the ore-project amount of habitat quantified in terms of soawnina or rearina habitat

A habitat discussion was not included. It could be relevant to a discussion of limiting factors in the basin other than the project. In addition, if run size is increased will there be sufficient habitat available.

3. Were predicted changes in habitat quantified in terms of soawna or rearina habitat so that estimates of fish can be made

No.

C. Fish

1. Were the taraget species clearly identified

Spring and summer chinook, sockeye, and steel head were discussed in terms of stocks present. However, benefits were not discussed for sockeye.

2. Were predict i ons of change in numbers of each taraget species based on auantif ied changes in habitat

No. This was not directly applicable.

3. If the predicted chanae in numbers of fish was based on adults. were the survival rates clearly stated for conversion from smolt or iuveni le to adult

The change in number of fish was not thoroughly documented.

4. Was hatchery supplementation discussed

No, the run would bui ld naturally.

D. Economic

1. Were all Project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes.
- c. Eval uati on - No costs were estimated.
- d. Operation & Maintenance - No. This would be provided by Chelan County PUD.
- e. Other Contributed Funds - None listed, but Chelan County PUD would provide O+M.

2. What was the dollar value of the target species based on

Meyer (1982) report for escaped spawners.

spring and summer chinook - \$500

sockeye - \$18

steelhead \$359, but a value of \$270 was used.

3. Was the time when the benefits would start determined

No. A yearly projection of benefits was not provided.

4. Was the effective life of the project clearly stated

No, it was not provided.



SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: **DE-A179-83BP-10068**  
 PROJECT NUMBER: 82-1  
 PROJECT NAME: Inventory of Clear Creek, Orofino Creek and the **Potlatch** River, Idaho  
 SUBBASIN NAME: Clearwater TARGET SPECIES:  
 LOCATION: STATE: Idaho COUNTY:  
 TYPE OF PROJECT: **INSTREAM** \_\_\_ PASSAGE \_\_\_ PONDS \_\_\_ INVENTORY **X**  
 SIDE **CHANNEL** \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984												
<b>1985</b>												
<b>1986</b>												
OTHER'												
TOTAL												

'Contributed Funds

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) \_\_\_

PREDICTED					ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

## SUMMARY

### 1. Abstract

Physical and biological data were collected on 25 streams tributary to Clear Creek, Orofino Creek, and the Potlatch River in and adjacent to the Nez Perce Indian Reservation in Idaho. The project utilized electrofishing and snorkeling methods to estimate fish densities, and USFS methods of measuring physical parameters. Barriers to upstream migrating salmon and steelhead were assessed and recommendations made for correcting barriers and enhancing the production of salmon and steelhead.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

No - Work statements, contract agreements and expenditure records were not available.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

The inventory was conducted to determine limiting factors, however, these were not separated nor summarized as such.

##### 2. Was the approximate amount of habitat quantified in terms of spawning or rearing habitat

Quantity of habitat was not presented.

##### 3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Not applicable (N/A) - no predictions made.

#### C. Fish

##### 1. Were the target species clearly identified

No. Surveys **were** conducted of existing populations.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No predictions made.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from srolt or juvenile to adult

N/A

4. Was hatchery supplementation discussed

**N/A**

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - No.
- b. Construction - No.
- c. Evaluation - No.
- d. Operation & Maintenance - No.
- e, Other Contributed Funds - No.

2. What was the dollar value of the taraet species based on

N/A

3. Was the time when the benefits would start determined

N/A

4. Was the effective life of the project clearly stated

N/A

D2

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16475  
 PROJECT NUMBER: 84-5/83-501 RELATED PROJECT NUMBERS: 83-502; 83-7  
 PROJECT NAME: South Fork Clearwater River Habitat Enhancement  
 STREAM(S): Red River  
 SUBBASIN NAME: Clearwater River TARGET SPECIES: steelhead trout, chinook salmon  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE    PONDS     
 SIDE CHANNEL    RIPARIAN X

PUBLISHED IN: Natural propagation and habitat improvement, Volume II Idaho Annual and Final Reports  
 1984 (January 1986). and Vol. III - Idaho Annual and Final Reports 1982/83 (April 1984)  
 Also: Idaho habitat evaluation for offsite mitigation record. Annual Report, 1984  
 (July 1985).

CONTRACTOR: USFS Nez Perce National Forest TYPE: FEDERAL X STATE    TRIBE    PRIVATE     
 PROJ. LEADER: Don Hair (Proj. Bio.) Rick Stowell (Proj. Coordinator)  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: January 1, 1984  
 COMPLETION DATE: December 1990  
 PRESENT STATUS: construction complete  
 PROJECT LIFE (YEARS): 100

D25

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	<u>558,000</u>	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	<u>21</u>	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
SMOLT:	summer steelhead	-----	<u>14,200</u>	-----	<u>33,180</u>	-----
	spring chinook	-----	<u>16,580</u>	-----	<u>38,700</u>	-----
ADULT:	summer steelhead	-----	-----	-----	<u>464</u>	-----
	spring chinook	-----	-----	-----	<u>530</u>	-----
	resident fish	-----	<u>23,550</u>	-----	<u>54,590</u>	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84BP16475  
 PROJECT NUMBER: 84-5/83-501  
 PROJECT NAME: South Fork Clearwater River Habitat Enhancement  
 SUBBASIN NAME: Clearwater River TARGET SPECIES: steelhead trout, chinook salmon  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE X PONDS      
                   SIDE CHANNEL     RIPARIAN X  
 BEGINNING DATE: January 1, 1984  
 ENDING DATE: December 1990  
 PRESENT STATUS: construction complete  
 PROJECT LIFE (YEARS): 100

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL	PREDICTED		ACTUAL		
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983							\$82,504 <sup>2</sup>	\$78,015 <sup>2</sup>				
1984			\$5,000			\$5,000	87,893	90,781				
1985												
1986												
OTHER <sup>1</sup>						36,000	36,000					
TOTAL		\$5,000			\$5,000	\$206,397	\$204,796					

<sup>1</sup>contributed Funds

<sup>2</sup>Sufficient detail was not available to separate total predicted or actual costs into plan/dgn., constr., or eval.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 4

PREDICTED				ACTUAL			
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS
0-7			\$725,461 <sup>3</sup>				
1-100	\$445,470/yr	\$10,916,242					
TOTAL				TOTAL			

DISCOUNTED BENEFITS : DISCOUNTED COSTS 15.0:1

DISCOUNTED BENEFITS : DISCOUNTED COSTS    

<sup>3</sup>No methods were given for deriving this cost estimate.

SUMMARY

1. Abstract

This is a habitat improvement project associated with environmental degradation as a result of dredge mining, grazing by domestic livestock, logging and road building. Restoration efforts and management options have been hampered by the presence of private lands (primarily grazing) in the prime anadromous fish production areas.

During FY 1983 work accomplished included: 50 boulders placed in the stream; four deflector/cover structures installed; nine trees placed in the stream; 222 ft. of bank stabilized with logs; 24,820 ft. of riparian plantings; 1,100 ft. of fence constructed; and 2.1 acres seeded and fertilized.

During FY 1984 habitat improvement structures installed included: log covers; rock and log weirs; boulder placement; anchored debris; rock and log deflectors; bank stabilization; bank cover and riparian planting; and riparian fencing. Other field activities under the 1984 contract included fish habitat surveys in nine Reaches of Red River and random samples of the proportion of fine sediment in spawning areas.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

B. Habitat

1. Were limiting factors discussed in detail

No. A list was given, but no discussion or justification was available.

2. Was the on-project amount of habitat quantified in terms of spawning or rearing habitat

No.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

D20

C. Fish1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No. Prediction was based on a Biological Potential without justification.

Benefits = Biological Potential -  
Current Production Level  
(1/3 of potential)

Therefore, benefits equaled two-thirds of an estimate biological potential.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Yes. steelhead = 1.6%; chinook = 1.2%

4. Was hatchery supplementation discussed

Historical stocking was described, but future stocking was not addressed.

D. Economic1. Were all project costs included in documents

- a. Planning/Design - Not separated.
- b. Construction Not separated.
- c. Evaluation - Predicted under 83-7, but actual not separated. Assumed total amount expended.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - USFS funds prior to FY 1983 were listed. USFS funds were expended in FY 1983, but were listed as man-days and quantities of materials rather than dollars.

BPA funds originally allocated to a contract with ODFW and used on this contract to obtain easement rights on private land was noted, but no value or detail was given.

2. What was the dollar value of the target species based on

Meyer 1982. \$550 per spawning chinook and 9359 per spawning steel head.

3. Was the time when the benefits would start determined

No. Apparently used year 1 for start date of benefits discounting

4. Was the effective life of the project clearly stated

No - used a perpetuity (100 yrs. 1 to discount benefits.

D29

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16475  
 PROJECT NUMBER: 84-5/83-502 RELATED PROJECT NUMBERS: 83-501; 83-7  
 PROJECT NAME: South Fork Clearwater River Habitat Enhancement  
 STREAM(S): Crooked River  
 SUBBASIN NAME: South Fork Clearwater TARGET SPECIES: summer steelhead, spring chinook  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE X PONDS X  
 SIDE CHANNEL      RIPARIAN X  
 PUBLISHED IN: Natural propagation and habitat improvement, Vol. III - Idaho. Final and Annual  
 Reports 1982/83 (April 1984). Vol. II - Idaho. Final and Annual Reports 1984  
 (January 1986). Also: Habitat evaluation for offsite mitigation record.  
 Annual Report 1984 (July 1985).  
 CONTRACTOR: USFS Nez Perce National Forest TYPE: FEDERAL X STATE      TRIBE      PRIVATE       
 PROJ. LEADER: Rick Stowell  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: January 1, 1984  
 COMPLETION DATE: December 31, 1990  
 PRESENT STATUS: Construction Complete  
 PROJECT LIFE (YEARS): 100

D30

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT</u> <u>CONDITIONS</u>	<u>POST-PROJ.</u> <u>CONDITIONS</u>	<u>PREDICTED</u> <u>CHANGE</u>	<u>ACTUAL</u> <u>CHANGE</u>	<u>FISH PRODUCED PER</u> <u>UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	<u>13,733</u>	-----	<u>4,533</u>	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	<u>17</u>	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
SMOLT:	summer steelhead	-----	-----	-----	<u>8,729</u>	-----
	spring chinook	-----	-----	-----	<u>9,366</u>	-----
ADULT:	summer steelhead	-----	-----	-----	<u>139</u>	-----
	spring chinook	-----	-----	-----	<u>112</u>	-----
	resident fish	-----	-----	-----	<u>13,300</u>	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

CONTRACT NUMBER: DE-A179-84BP16475  
 PROJECT NUMBER: 84-5/B3-502  
 PROJECT NAME: South Fork Clearwater River Habitat Enhancement  
 SUBBASIN NAME: Clearwater River TARGET SPECIES: summer steelhead, spring chinook  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE X PONDS X  
 SIDE CHANNEL     RIPARIAN X  
 BEGINNING DATE: January 1, 1984  
 ENDING DATE: December 31, 1990  
 PRESENT STATUS: Construction Complete  
 PROJECT LIFE (YEARS): 100

D31

FY	INITIAL COSTS						CONTINUING COSTS			
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED	ACTUAL
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.
1982										
1983							\$24,985 <sup>2</sup>	\$1,489 <sup>2</sup>		
1984	\$32,365	\$61,700	\$10,000			\$10,000	104,065	123,531 <sup>2</sup>		
1985										
1986										
OTHER <sup>1</sup>	5,500			\$5,500			5,500	5,500		
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	\$37,865	\$61,700	\$10,000				\$134,500	\$130,520		

<sup>1</sup>Contributed Funds

<sup>2</sup>Sufficient detail was not available to separate total predicted or actual costs into plan/dgn., const., or eval.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 4

PREDICTED				ACTUAL			
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS
0-5							
6-100	\$111,500	\$2,245,757					\$361,082 <sup>3</sup>
=====	=====	=====	=====	=====	=====	=====	=====
TOTAL				TOTAL			

DISCOUNTED BENEFITS : DISCOUNTED COSTS 6.2:1

DISCOUNTED BENEFITS : DISCOUNTED COSTS       

<sup>3</sup>No methods were presented for deriving this cost estimate.

## SUMMARY

### 1. Abstract

Habitat degradation in Crooked River was a result of dredge mining and road construction. In FY 1983 the USFS proposed removal of a culvert barrier and construction of a pipe-arch to improve passage. Planning and design was conducted in FY 1983 using \$1,489 of BPA funds and \$5,500 of USFS funds. Modification M001 increased the budget by \$17,146 to 942,131 on 1/31/84. No reason for this modification was given and no further discussion of the work was available in the 1984 annual report. Apparently the predicted costs for FY 1983 included construction budgets which were not expended in FY 1984. The pipe-arch design was changed to a bridge structure and appears to have been built in 1984.

Instream structures to improve rearing habitat and stabilize stream banks were installed in FY1984. These included: log and boulder weirs, boulders, anchored debris, digger logs, log deflectors, off-channel pond connection, bank rip rap and bank re-vegetation.

The predicted and actual cost summaries were difficult to accurately track and may be in error as summarized here.

No proposal, work statement, costing or use could be found for the subcontract with Washington State University (Purchase Order No. 43-0295-4-592) titled "Planning for the restoration of meanders on a trial basis".

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

Yes. Except for information regarding the purpose and expenditures related to the sub-contract with Washington State University.

#### e. Habitat

##### 1. Were limiting factors discussed in detail

No. Limiting factors were mentioned, but no details, quantification or justification was given.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Spawning habitat quantity was given, but not rearing.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

C. Fish

1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No. Based on estimate of biological potential:

Predicted Benefit = Biological Potential -  
Current Production Level  
(1/3 of potential)

Therefore, the benefits equal two-thirds of the estimated biological potential.

No basis was given for these estimates.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Yes. Steelhead = 1.6%; Chinook = 1.2%

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all project costs included in documents

a. Planning/Design - Not clearly separated

b. Construction - Yes, but not clearly separated

- C. Evaluation - Estimate taken from Project no. 83-7 work statement. No actual costs were itemized - assumed **full** expenditure.
  - d. Operation & Maintenance - No.
  - e. Other Contributed Funds - Yes.
2. What was the dollar value of the target species based on  
Meyer 1982. \$550 for chinook spawners; 1 359 for steelhead spawners.
3. Was the time when the benefits would start determined  
No. Start date for benefits discounting was unclear, but appeared to be year 6.
4. Was the effective life of the project clearly stated  
No, used 100 years for benefits discounting.

D34





SUMMARY-

1. Abstract

Channel improvements were initiated in Lake Branch Creek in fiscal year (FY) 1983 under project number 83-386. During FY 1984 further improvements were implemented on Lake Branch Creek under project number 84-11. This project number also includes collawash Falls passage and FY 1984 work on Fish/Wash Creeks (previously 83-385). The purpose of this project, as stated in the 1983 Annual Report, was to provide unobstructed fish passage through Forest Service land and increase quantity and quality of spawning and rearing habitat for summer steelhead. The work conducted during FY 1983 included the placement of nine rock berms at river mile (RM) 5.5 and two gabions at RM 7.5. A single log jam was partially removed at RM 7.2 to facilitate fish passage but maintain the gravel retention and cover provided by the logs. Five of the rock berms were constructed to collect spawning gravel and provide rearing habitat while the remaining four rock berms were expected to improve juvenile rearing habitat at low flows. The two gabions also were installed to improve rearing habitat at low flows.

The FY 1984 work included four open log "V's" to accelerate velocities and form scour pools. Two log sills were installed to create a plunge pool, collect spawning gravel and protect a pool/riffle series from down cutting. A single log "K" dam was built to create a plunge pool. The inlet and outlet of a side channel were protected using three log wing deflectors and one rock deflector. These deflectors were to prevent lateral movement of the channel and direct the scour action during high flows.

2. Comment5

A. Availability of Documents

1. Were all documents available for review

Work statements and agreement contracts were missing from BPA files for FY 1983.

B. Habitat

1. Were limitina factors discussed in detail

Average habitat condition was considered good, but smolt levels were believed limited by spawning and rearing habitat availability and passage problems. No justification for these statements was given.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Quantification of habitat was not addressed in the work statements or reports. Only construction methods and type of structures were discussed.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. (see B.2. above)

C. Fish

1. Were the target species clearly identified

The proposals delineate primary target species.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No. Predictions of changes in fish numbers were not provided.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No predicted changes in fish numbers.

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all project costs included in documents

Predicted costs for FY 83 were not available.

- a. Planning/Design - FY 84 only
- b. Construction - FY 84 only
- c. Evaluation - FY 84 only
- d. Operation & Maintenance - No
- e. Other Contributed Funds - No

2. What was the dollar value of the target species based on

No method given for benefits estimate.

3. Was the time when the benefits would start determined

No method given for benefits estimate.

4. Was the effective life of the project clearly stated

Life of benefits stated to be 20 years. No discussion of expected project life was available.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16726 (also-83BP11968)  
 PROJECT NUMBER: 84-11/83-385 RELATED PROJECT NUMBERS: 83-386; 83-341  
 PROJECT NAME: Fish/Wash Creek STREAM(S): Fish and Wash Creeks  
 SUBBASIN NAME: Clackamas River TARGET SPECIES: spring chinook, coho, summer & winter steelhead  
 LOCATION: STATE: Oregon COUNTY: Clackamas  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS X  
 SIDE CHANNEL X RIPARIAN X

PUBLISHED IN: Natural propagation and habitat improvement. Vol. 1 - Oregon. Final & Annual Report. 1982/83 (April 1984). Also Vol. 1 - Oregon supplement A. An evaluation of in-channel & off channel projects. Annual Report 1984 (July 1986). Also: Abundance, behavior and habitat utilization by coho salmon and steelhead trout in Fish Creek, Oregon, as influenced by habitat enhancement. Annual Report 1985 (Sept. 1986).

CONTRACTOR: US Forest Service - Mt. Hood TYPE: FEDERAL X STATE      TRIBE      PRIVATE       
 PROJ. LEADER: David Heller  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER: 5/4  
 BEGINNING DATE: 1983 COMPLETION DATE: 1988  
 PRESENT STATUS: 1983 & 84 construction completed. Evaluation 1982-1985 completed  
 PROJECT LIFE (YEARS): 20

D40

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT CONDITIONS</u>	<u>POST-PROJ. CONDITIONS</u>	<u>SMOLTS PRODUCED PER UNIT OF HABITAT</u>			
			<u>PREDICTED CHANGE</u>	<u>ACTUAL CHANGE</u>	<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	2,540	-----	350-400	205	19.5-22	0
REARING AREA (SQ. YD.)	189,600	-----	5,100	-----	1.5	0
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	11	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	1/1 ac	60-190	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	1,024	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	15	4	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
SMOLT:	summer & winter steelhead	-----	8,000	7,473	1,000	0
	spring chinook	-----	?	?	?	0
	coho	-----	1-4,000	3,099	6,800	0

\* USE CODE IN REPORT OF ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS



## SUMMARY

### 1. Abstract

This project was initiated as number 83-385 and combined in FY 1984 with project number 83-386 as number 84-11. Approximately \$100,000 in Forest Service funds were spent on habitat work in Fish Creek from 1981 to 1983. This work included habitat and limiting factor assessment, work design, placement of instream structures and baseline data collection for future project evaluation.

BPA funded work in FY 1983 included construction of 14 rock berms (11 in Fish Creek and 3 in Wash Creek). These berms were intended to capture gravels suitable for spawning of steel head and salmon. An additional 11 rock berms were constructed with Forest Service funds in 1982 and 83. BPA funded work in FY 1983 also included construction of an off-channel pond (for rearing juvenile coho) and planting of cottonwood in four acres of riparian area to increase stream shading.

BPA funded work in FY 1984 included opening a flood overflow side channel by excavating the inlet and outlet to provide perennial flows and upstream access for adult and juvenile salmonids. Both spawning and rearing habitat were expected in this side channel, especially for chinook and coho. "Alcove" habitat enhancement was conducted by falling trees into Fish Creek with explosives. Twelve trees at six sites were felled to increase carrying capacity of edge alcoves for juvenile salmonid rearing.

An evaluation of all improvements was conducted since 1982 by the Forest Service to determine impacts on salmonid production. This evaluation was jointly funded by the BPA and US Forest Service, but no delineation of the actual Forest Service share was available.

Results of evaluation indicate fluctuations in salmonid populations in Fish Creek during years 1982 to 1985, but none of these fluctuations could be attributed to the habitat improvement work. Variation was attributed to environmental factors outside of the influence of the habitat improvements (i.e. variations in annual stream flow regime, onsite salmonid population limiting factors and offsite survival or escapement). The off-channel pond was reported to have twice the survival rate of coho juveniles as compared to the main channel, as well as, increased

D42

growth rates. However, no assessment was made of the actual or potential increase in coho salmon production as a result of this pond.

The February 23, 1986 flood exceeded the 5-year flood design of the rock berms and subsequently 16 of the 21 berms were breached. Evaluation showed that only 12 of the berms (breached & not breached) were meeting project objectives and had collected 171 m<sup>2</sup> (205 yd<sup>2</sup>) of spawning gravel.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

8. Habitat

1. Were limiting factors discussed in detail

A statement of the limiting factor(s) and estimates of existing production levels as a percent of potential were given in the work statements. These estimates and statements appeared to be based on professional judgment. More detailed discussions of limiting factors were included in the subsequent evaluation reports. These reports used habitat quantification and fish densities to distinguish spawning or rearing habitat as limiting.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Habitat was measured for six categories in the evaluation report, and the total of these termed rearing habitat. Spawning and rearing habitat were quantified by species from field surveys.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Predicted changes in spawning habitat and off-channel ponds were made and estimates of fish production made from these. Total habitat changes had to be interpreted from the data and were not stated explicitly.

D43

## c. Fish

1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Yes.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Not based on adults.

4. Was hatchery supplementation discussed

Yes. Stocking of the off-channel pond with hatchery fry was discussed, but no evidence of implementation was found in the reports.

D. Economic1. Were all project costs included in documents

a. Planning/Design - Partially separated.

b. Construction - Yes.

c. Evaluation - Yes.

d. Operation &amp; Maintenance - No.

e. Other Contributed Funds - Partially. Not specified for hatchery stocking and evaluation.

2. What was the dollar value of the target species based on

Not done.

3. Was the time when the benefits would start determined

Not done.

- . Was the effective life of the project clearly stated

20 years was used as an estimate.

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SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER:  
 PROJECT NUMBER: 84-11  
 PROJECT NAME: Collawash R. Falls Passage & Habitat Improvement  
 SUBBASIN NAME: Willamette/Clackamas  
 LOCATION: STATE: Oregon  
 TYPE OF PROJECT: INSTREAM X PASSAGE X PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_

RELATED PROJECT NUMBERS:  
 STREAM(S): Collawash River  
 TARGET SPECIES:  
 COUNTY: Clackamas

PUBLISHED IN:  
 CONTRACTOR: USFS TYPE: FEDERAL X STATE \_\_\_\_\_ TRIBE \_\_\_\_\_ PRIVATE \_\_\_\_\_  
 PROJ. LEADER:  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS: Postponed - not implemented prior to FY 1985  
 PROJECT LIFE (YEARS):

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HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
JUVENILE:	-----	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----	-----

\* USE CODE IN REPORT OF ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER:  
 PROJECT NUMBER: 84-11  
 PROJECT NAME: Clackamas/Hood River Habitat Enhancement  
 SUBBASIN NAME: Willamette/Clackamas  
 LOCATION: STATE: Oregon COUNTY: Clackamas  
 TYPE OF PROJECT: INSTREAM \_\_\_\_\_ PASSAGE \_\_\_\_\_ PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_  
 RELATED PROJECT NUMBERS:  
 STREAM(S): Oak Grove Fork  
 TARGET SPECIES:  
 PUBLISHED IN:  
 CONTRACTOR: TYPE: FEDERAL \_\_\_\_\_ STATE \_\_\_\_\_ TRIBE \_\_\_\_\_ PRIVATE \_\_\_\_\_  
 PROJ. LEADER:  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS: Postponed - not implemented prior to FY 1985  
 PROJECT LIFE (YEARS):

D47

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*				
JUVENILE:	-----	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-83BP1190  
 PROJECT NUMBER: 83-341  
 PROJECT NAME: West Fork Hood River Passage  
 SUBBASIN NAME: Hood River  
 LOCATION: STATE: Oregon  
 TYPE OF PROJECT: INSTREAM      PASSAGE X PONDS       
                   SIDE CHANNEL      RIPARIAN       
 RELATED PROJECT NUMBERS: 83-386; 84-11  
 STREAM(S): West Fork Hood River  
 TARGET SPECIES: summer steelhead, spring & fall chinook, coho  
 COUNTY: Hood River  
 PUBLISHED IN: Natural propagation and habitat improvement. Vol.I - Oregon Final & Annual Report 1982/83 (April 1984)  
                   Also: natural propagation and habitat improvement. Vol. I - Oregon. Final & Annual Report 1984 (January 1986).  
 CONTRACTOR: Oregon Dept. Fish & Wildlife                   TYPE: FEDERAL      STATE X TRIBE      PRIVATE       
 PROJ. LEADER: Jim Newton  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE: April 1, 1983  
 COMPLETION DATE: January 31, 1985  
 PRESENT STATUS: Construction Complete  
 PROJECT LIFE (YEARS): 20

D48

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	0	406,750	406,750		0.07	(smolts)
REARING AREA (SQ. YD.)						
TOTAL USABLE AREA (SQ. YD.)						
STREAM LENGTH (MILES)						
POOL/RIFFLE RATIO						
PONDS (NO. & TOTAL ACREAGE)						
SIDE CHANNELS (SQ. YD.)						
RIPARIAN						
AREA (ACRES)						
STREAM LENGTH (MILES)						
DOWNSTREAM IMPACT (MILES)						
WATER TEMP. (DEG. C.)						
SEDIMENT						

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE#</u>			
SMOLT:	summer steelhead	----		29,000	----
ADULT:	summer steelhead	----		1,176	----

\* USE CODE IN REPORT OF STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS



PROJECT SUMMARY

1. Abstract

DPA funds were allocated in FY 83 and 84 to plan, design and construct a structure to facilitate upstream passage of anadromous salmonids over a falls on the West Fork Hood River. The 10 to 15 foot falls was a result of hydraulic cutting of the channel during the last 10 to 15 years. Construction occurred in August and September of 1985. A series of stair-stepped concrete weirs was constructed.

Original estimates for completing all phases of the project were 8106,900. This estimate was increased in the FY 1984 budget to 4400,127 after preliminary designs and estimates were received from contractors. As of 12/31/85 total funds allocated to complete the construction phase amounted to 4616,127.

No evaluation of the actual passage over the facilities by adult steelhead or salmon was available.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

B. Habitat

1. Were limiting factors discussed in detail

The limiting factor consisted of a confirmed passage barrier

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Acreage of spawning habitat above the barrier was estimated. Estimates of rearing areas were not available.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes. (See 2.8.2 above)

D50

C. Fish

- 1.
- Were the target species clearly identified

Yes.

- 2.
- Were predictions of change in numbers of each target species based on quantified changes in habitat

Smolt production per acre of stream above the diversion was based on resident trout densities (330 fish per acre) observed in upper Hood River tributaries.

- 3.
- If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Survival rate from smolt to adult: 8%.

Ratio of catch to escapement: 1:1.

No justification was given for using these figures.

- 4.
- Was hatchery supplementation discussed

No.

D. Economic

- 1.
- were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes. To 9/85. Final Billings not in file as yet.
- c. Evaluation - No.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - No.

- 2.
- What was the dollar value of the target species based on

Meyer (1982) and a catch to escapement ratio of 1:1 and \$179 per spawning steelhead.

Was the time when the benefits would start determined

No. Assumed as year 1 for benefits discounting.

4 Was the effective life of the project clearly stated

No. Assumed 20 year life for benefits discounting. Engineering descriptions of each alternative gave an estimate of project life. These ranged from 5 to 40 years.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-81BP31847  
 PROJECT NUMBER: 81S-8 RELATED PROJECT NUMBERS: 81-108  
 PROJECT NAME: Fish Habitat Rehabilitation & Enhancement of the Channelized Sections of Beaver Creek  
 STREAM(S): Beaver Creek  
 SUBBASIN NAME: Deschutes River (Warm Springs River) TARGET SPECIES: summer steelhead and spring chinook  
 LOCATION: STATE: Oregon COUNTY: Wasco  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
                   SIDE CHANNEL      RIPARIAN X  
 PUBLISHED IN: Habitat quality and baseline data, Annual Report 1985  
 CONTRACTOR: Confederated Tribes Warm Springs Indian Reservation TYPE: FEDERAL      STATE      TRIBE X PRIVATE       
 PROJ. LEADER: Chris Stainbrook  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER: 4th  
 BEGINNING DATE: 1986  
 COMPLETION DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D53

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	50,674		less but improved <sup>1</sup>			
REARING AREA (SQ. YD.)						
TOTAL USABLE AREA (SQ. YD.)						
STREAM LENGTH (MILES)						
POOL/RIFFLE RATIO						
PONDS (NO. & TOTAL ACREAGE)						
SIDE CHANNELS (SQ. YD.)						
RIPARIAN						
AREA (ACRES)						
STREAM LENGTH (MILES)						
DOWNSTREAM IMPACT (MILES)						
WATER TEMP. (DEG. C.)						
SEDIMENT						

<sup>1</sup>The changes would result in less spawning area of higher quality

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*	
SMOLT:	spring chinook	-----	6,500-7,000
	summer steelhead	-----	4-fold increase in age +1
ADULT:	spring chinook	-----	163-175
	summer steelhead	-----	not estimated

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-81BP31847  
 PROJECT NUMBER: 81S-8  
 PROJECT NAME: Fish Habitat Rehabilitation & Enhancement of the Channelized Sections of Beaver Creek  
 SUBBASIN NAME: Deschutes River (Warm Springs River) TARGET SPECIES:  
 LOCATION: STATE: Oregon COUNTY:  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE \_\_\_ PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: 1986  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984												
1985												
1986	\$79,355						\$79,355					
OTHER <sup>1</sup>												
TOTAL	\$79,355						\$79,355					

<sup>1</sup>Contributed Funds

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) \_\_\_

YEARS OCCURRING	BENEFITS	PREDICTED		YEARS OCCURRING	BENEFITS	ACTUAL	
		DISCOUNTED BENEFITS	DISCOUNTED COSTS			DISCOUNTED BENEFITS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====
TOTAL				TOTAL			

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

## SUMMARY

### 1. Abstract

Beaver Creek is a tributary to the Warm Springs River. During construction of Highway 26, about 3 miles were channelized with a loss of gravel, riparian habitat, and pools. The results of fish sampling show that the non-channelized reaches have a higher biomass of juvenile salmonids than channelized reaches. The proposed action would result in placement of instream structures in the channelized reaches to increase pool to riffle ratios from 0:1 to 5:1, provide instream cover, narrow the stream channel to provide greater depth, and create gravel bars for spawning. The 50,674 yd<sup>2</sup> of spawning gravel was underutilized or not used at all. The main objective of the work was to increase rearing habitat for over-wintering.

### 2. Comments

#### a. Availability of Documents

##### I. Were all documents available for review

The proposal was reviewed. It was the only document available.

#### B, Habitat

##### I. Were limiting factors discussed in detail

Several limiting factors were discussed but the main emphasis was on the channelized portion of Highway 26 when it was constructed. The pool area as well as, water depths and insufficient gravel were considered limiting. However, arguments for limiting factors were not given.

##### 2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Yes, the spawning habitat was quantified but a decreased amount was not given due to increase of rearing habitat upon completion of work. The quality of the pre-project habitat condition was probably not good.

D55

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

C. Fish

1. Were the target species clearly identified

Summer steelhead and spring chinook.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Not sure. The improvement of the spawning habitat was estimated to provide quality habitat for 584 and 400 pairs of spawning spring chinook and summer steelhead, respectively.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No basis was given for the increase in chinook smolts. Steelhead predicted changes were based on the Camp Creek estimate of four-fold increases with changes.

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Appeared to be included, but the costs in the proposal were \$90,978 and in the BPA Contract only \$79,335.
- b. Construction - Yes.
- c. Evaluation - No.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - None listed

2. What was the dollar value of the target species based on

No value was used to predict benefits.

3. Was the time when the benefits would start determined

No.

4. Was the effective life of the project clearly stated

No, it was not stated.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-BP31837 Also: DE-AI79-83BP13047  
 PROJECT NUMBER: 81S-8 RELATED PROJECT NUMBERS: 81-108  
 PROJECT NAME: Habitat Quality & Anadromous Fish Production Potential on the Warm Springs Indian Reservation  
 STREAM(S): Shitike Creek, Warm Springs System  
 SUBBASIN NAME: Deschutes TARGET SPECIES: chinook salmon, steelhead trout  
 LOCATION: STATE: Oregon COUNTY: Wasco and Jefferson  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE \_\_\_ PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_ INVENTORY X  
 PUBLISHED IN: Natural propagation and habitat improvement. Volume 1: Oregon - Final  
 and Annual Reports 1984 (January 1986). Habitat quality and baseline data.  
 Annual Report 1985, Project 81S-8  
 CONTRACTOR: Confederated Tribes Warm Springs Indian Reservation TYPE: FEDERAL \_\_\_ STATE \_\_\_ TRIBE X PRIVATE \_\_\_  
 PROJ. LEADER: Terry Luther  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE: September 25, 1981  
 COMPLETION DATE: December 31, 1989  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D58

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT CONDITIONS</u>	<u>POST-PROJ. CONDITIONS</u>	<u>PREDICTED CHANGE</u>	<u>ACTUAL CHANGE</u>	<u>FISH PRODUCED PER UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>			
JUVENILE:	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-81BP31837 Also: DE-AI79-83BP13047  
 PROJECT NUMBER: 81S-8  
 PROJECT NAME: Habitat Quality Anadromous Fish Production potential on the Warm Springs Indian Reservation  
 SUBBASIN NAME: Deschutes TARGET SPECIES: chinook salmon, steelhead trout  
 LOCATION: STATE: Oregon COUNTY: Wasco and Jefferson  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE \_\_\_ PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: September 25, 1981  
 ENDING DATE: December 31, 1989  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982	\$12,200						\$12,200					
1983	53,000						53,000					
1984	111,108 <sup>2</sup>						111,108					
1985	120,934						120,934					
1986	118,243	79,355					197,598					
OTHER <sup>1</sup>												
D59												
TOTAL	\$415,484	\$79,355 <sup>3</sup>					\$494,840	\$311,332 <sup>4</sup>				

<sup>1</sup>Contributed Funds

<sup>2</sup>\$10,000 appears to be for Strawberry Falls

<sup>3</sup>Appears to be construction funds for Beaver Creek

<sup>4</sup>Through October 31, 1986, and \$7,309 appears to have been for Strawberry Falls. See Summary for Strawberry Falls Passage

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) \_\_\_\_\_

PREDICTED					ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

## SUMMARY

### 1. Abstract

This project was proposed for 3 phases. Apparently some work was done in FY 82, but no reports of expenditures were available. Phase I was an anadromous fish data compilation for the Shitike Creek and the Warm Springs River basins including the Warm Springs River, Beaver Creek, Mill Creek, and Eadger Creek. The study was to identify anadromous fish stocks, water chemistry and dynamics, habitat and limiting factors. Phase II was to determine the full spawning and tearing potential of the Warm Springs River System above Warm Springs National Fish Hatchery and to determine and utilize the full spawning and rearing potential of Shitike Creek to provide optimum production and return of anadromous salmonids. Phase III efforts were scheduled to begin in FY 84 and completed in FY 1992. The goal of Phase III was to implement the enhancement measures identified in phase II.

The annual report for 1985 discussed several activities including inventory work, barrier bypass at Strawberry Falls and a proposal for rehabilitation of Beaver Creek because of encroachment when Highway 26 was built. The construction appeared to be for the Beaver Creek implementation. The Strawberry Falls and Beaver Creek projects were presented separately.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

No. The phase I report was not available. Also, references were made to removal of the Headworks Dam in 1983 in Shitike Creek, but no report was provided that discussed the increase in spawning and rearing area as a result of this dam removal.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

No detailed analysis was made. A statement was made that reservation streams have supplied over 120 miles of anadromous fish habitat but only 80 miles of streams were producing fish and production is low. Strawberry Falls on Mill Creek was listed as limiting passage. Also, stream

channel degradation caused by the 1964 flood and channelization projects. as well as, lack of riparian vegetation were potential problems in Shitike Creek. Passage barriers to adults existed at the mouth of Badger Creek during low flows. In Mill Creek stream braiding may impede adult passage. Also lack of riparian vegetation and an unstable channel may affect production. In the Warm Springs River, riffle-pool ratios may be a problem and high temperatures have been reported.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

It was not included in the reports although the reports appeared to summarize data and all reports were not available.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. See 2.

C. Fish

1. Were the target species clearly identified

Spring chinook and summer steel head.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

This was an inventory basically.

3. If the Predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Not applicable (N/A).

4. Was hatchery supplementation discussed

No.

D61

D. Economic

1. Were all project costs included in documents
  - a. Planning/Design No
  - b. Construction No.
  - c. Evaluation - No.
  - d. Operation & Maintenance No.
  - e. Other Contributed Funds None listed.
2. What was the dollar value of the target species based on

Not done.
3. Was the time when the benefits would start determined

Specific benefits were not listed except for Strawberry Falls (10 miles).
4. Was the effective life of the project clearly stated

N/A

D62

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-83BP13047 - Strawberry Falls Passage  
 PROJECT NUMBER: 81S-8 RELATED PROJECT NUMBERS:  
 PROJECT NAME: Habitat Quality and Anadromous Fish Production Potentials in the  
 Warm Springs Indian Reservation STREAM(S): Mill Creek  
 SUBBASIN NAME: Deschutes River TARGET SPECIES: spring chinook and summer steelhead  
 LOCATION: STATE: Oregon COUNTY: Wasco and Jefferson  
 TYPE OF PROJECT: INSTREAM \_\_\_\_\_ PASSAGE X PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_  
 PUBLISHED IN: Natural propagation and habitat improvement. Volume 1: Oregon. Final and Annual  
 Reports 1984 (January 1986). Also, Habitat quality and baseline data,  
 Annual Report 1985.  
 CONTRACTOR: Confederated Tribes Warm Springs Indian Reservation TYPE: FEDERAL \_\_\_\_\_ STATE \_\_\_\_\_ TRIBE X PRIVATE \_\_\_\_\_  
 PROJ. LEADER:  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE: 1984  
 COMPLETION DATE: 1984  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D63

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT CONDITIONS</u>	<u>POST-PROJ. CONDITIONS</u>	<u>PREDICTED CHANGE</u>	<u>ACTUAL CHANGE</u>	<u>FISH PRODUCED PER UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	<u>10</u>	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
FONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>			
ADULT:	summer steelhead	-----	<u>0</u>	-----	-----
	spring chinook	-----	<u>0</u>	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-83BP13047 - Strawberry Falls Passage  
 PROJECT NUMBER: 81S-8  
 PROJECT NAME: Habitat Quality and Anadromous Fish Production Potential in the  
 Warm Springs Indian Reservation.  
 SUBBASIN NAME: Deschutes River TARGET SPECIES: spring chinook & summer steelhead  
 LOCATION: STATE: Oregon COUNTY: Wasco and Jefferson  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN   
 BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983	unknown	\$10,000			\$7,309							
1984												
1985												
1986												
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL		\$10,000			\$7,309							

<sup>1</sup>Contributed Funds

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) _____									
PREDICTED		ACTUAL			PREDICTED		ACTUAL		
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

SUMMARY

1. Abstract

Strawberry Falls, on Mill Creek, was a passage barrier to adult anadromous salmonids. The falls was bypassed by placing a berm in the channel upstream of the falls and diverting the water into an old channel after excavating the material. although hatchery supplementation was not discussed, adult spring chinook were placed above the falls starting in 1982. The report mentioned that summer steelhead and spring chinook redds were seen above the falls in 1985.

2. Comments

A. Availability of Documents

1. Were all documents available for review

There were no specific reports for Strawberry Falls.

B. Habitat

1. Were limiting factors discussed in detail

No. There was little discussion of limiting factors, except for the barrier.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

C. Fish

1. Were the target species clearly identified

Spring chinook and summer steel head.

2. Were predictions of change in numbers of each target species based on Quantified changes in habitat

No predictions were made.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No predictions made.

4. Was hatchery supplementation discussed

Adult spring chinook outplants were made above the falls starting in 1982. Steelhead were not outplanted at that time.

D. Economic

1. Were all project costs included in documents

a. Planning/Design - Could not separate from the Warm Springs studies.

b. Construction Yes.

c. Evaluation No.

d. Operation & Maintenance No; some could be required.

e. Other Contributed Funds - None listed.

2. What was the dollar value of the target species based on

No benefits listed.

3. Was the time when the benefits would start determined

No benefits listed.

4. Was the effective life of the project clearly stated

No, it was not stated.



SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-A179-83BP14228  
 PROJECT NUMBER: 83-423  
 PROJECT NAME: Trout Creek Riparian Enhancement  
 SUBBASIN NAME: TARGET SPECIES: summer steelhead  
 LOCATION: STATE: Oregon COUNTY:  
 TYPE OF PROJECT: INSTREAM X PASSAGE     PONDS      
 SIDE CHANNEL     RIPARIAN X  
 BEGINNING DATE: September 1, 1983  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

INITIAL COSTS

CONTINUING COSTS

FY	<u>PREDICTED (BUDGET)</u>			<u>ACTUAL (INVOICES)</u>			<u>TOTAL</u>		<u>PREDICTED</u>				<u>ACTUAL</u>			
	<u>PLAN/DGN.</u>	<u>CONST.</u>	<u>EVAL.</u>	<u>PLAN/DGN.</u>	<u>CONST.</u>	<u>EVAL.</u>	<u>PRED.</u>	<u>ACTUAL</u>	<u>OPER&amp;MAINT</u>		<u>MONIT.</u>		<u>OPER&amp;MAINT</u>		<u>MONIT.</u>	
1982																
1983	\$86,000	(Phase I)						\$86,000								
1984	147,000	(Phase II & \$36,197	Phase III)					183,197								
1985	17,586	(Phase III)						17,586								
1986																
OTHER <sup>1</sup>																
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	\$286,783							\$286,783 <sup>2</sup>								

<sup>1</sup>Contributed Funds  
<sup>2</sup>As of September 1985.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%)    

YEARS OCCURRING	<u>PREDICTED</u>			<u>ACTUAL</u>		
	<u>BENEFITS</u>	<u>DISCOUNTED BENEFITS</u>	<u>COSTS</u>	<u>BENEFITS</u>	<u>DISCOUNTED BENEFITS</u>	<u>COSTS</u>
Annual	\$500,000	(minimal)				
=====	=====	=====	=====	=====	=====	=====
TOTAL						

DISCOUNTED BENEFITS : DISCOUNTED COSTS    

DISCOUNTED BENEFITS : DISCOUNTED COSTS

## SUMMARY

### 1. Abstract

This project was developed in 3 phases. The Phase I annual report was a basin overview that generally described fisheries, hydrology, geomorphology, vegetation, and wildlife. Phase II was an attempt to obtain watershed data by conducting stream surveys, literature search, and landowner contact. The report for this phase was not available, however, it was proposed to be a technical restoration plan including identification of habitat problems and alternatives. Phase III was a benefit/cost analysis.

The Phase I report noted that riparian restoration would increase the adult spawners by 1,300 fish. The basis for this estimate was not described. This was equated to a value of at least \$500,000 in the scope of work for the project.

In addition to the PHASE I report, one other report was available for review. Although not stated, we presume it to be the Phase III report. This was titled: Final Report, Benefit Cost Analysis, Various Individual Stream Reaches of Trout Creek and Tributaries, BPA Contract no. DE-AP79-86BP61619, February 13, 1986. It included a similar report for Reach 8 of the Trout Creek project in an appendix. This latter report was prepared under contract DE-AC79-83BP14228 and has a May 15, 1985 date. The report describes prescriptions for each reach, quantifies the predicted change in numbers of juveniles, calculates an annual benefit based on adults and eventually a benefit to cost ratio. The report does not, however, describe the method of assigning numbers of juveniles to each structure (prescription) and does not provide comparisons to similar structures so that a range of potential benefits can be considered. The benefits appear to depend to a large degree on reduction of temperatures in the lower reaches as well as increases in volume of water from riparian restoration. Overall, the benefits may be realistic but the costs appear to be underestimated.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

No. Only Phase I annual report 1983 was available. The complete work is presently being prepared by BPA

The benefit/cost analyses although reviewed was not used to reflect comments in this analysis and the data were not used in the summary forms.

B. Habitat

1. Were limiting factors discussed in detail

Generally described as high water temperature, riparian degradation, low flow due to irrigation, and unscreened diversion.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

c. Fish

1. Were the target species clearly identified

Summer steel head.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Possibly, but the data or analysis was not presented. USFWS and NMFS reports were cited which could include these.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No survival estimates were discussed, but USFWS and NMFS reports were cited which could include these.

4. Was hatchery supplementation discussed

No.

D Economic

1. Were all project costs included in documents
  - a. Planning/Design - No, we had only the Phase I report.
  - b. Construction - No.
  - c. Evaluation - No.
  - d. Operation & Maintenance - No.
  - e. Other Contributed Funds - Not listed.
2. What was the dollar value of the target species based on

No estimate was given.
3. Was the time when the benefits would start determined

No.
4. Was the effective life of the project clearly stated

No.

D71

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-A179-83BP12910 (ODFW) -83BP11992 (USFS) -84BP13661 & -83BP12152 (OTT)  
 PROJECT NUMBER: 83-440, 83-450 RELATED PROJECT NUMBERS:  
 PROJECT NAME: White River Falls Passage STREAM(S): White River and all tributaries  
 SUBBASIN NAME: Deschutes River TARGET SPECIES:  
 LOCATION: STATE: Oregon COUNTY: Wasco  
 TYPE OF PROJECT: INSTREAM \_\_\_\_\_ PASSAGE X PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_  
 PUBLISHED IN: Natural propagation and habitat improvement, Volumes 1B, 1C, 1D: Oregon.  
 Annual Reports 1983 (April 1984).  
 CONTRACTOR: USFS, ODFW & Ott Water Eng. TYPE: FEDERAL X STATE X TRIBE \_\_\_\_\_ PRIVATE X  
 PROJ. LEADER: Dave Heller, Robert Lindsey, Ronald F. Ott  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER: 4  
 BEGINNING DATE: 1983  
 COMPLETION DATE:  
 PRESENT STATUS: Preferred alternative selected. Not approved - project postponed.  
 PROJECT LIFE (YEARS): 50

D/72

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED <sup>1</sup> CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	0	-----	18,000	-----	-----	-----
REARING AREA (SQ. YD.)	0	-----	300,000	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	0	-----	318,000	-----	-----	-----
STREAM LENGTH (MILES)	0	-----	170	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

<sup>1</sup>Combination of estimates obtained from USFS and ODFW reports. Accuracy of this combined number is suspect.

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*				
JUVENILE:	-----	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-83BD12910 (ODFW) -83BP11992 (USFS) -84BP13661 -83BP12152 (Ott)  
 PROJECT NUMBER: 83-440, 83-450  
 PROJECT NAME: White River Falls Passage  
 SUBBASIN NAME: Deschutes River TARGET SPECIES:  
 LOCATION: STATE: Oregon COUNTY: Wasco  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: 1983  
 ENDING DATE:  
 PRESENT STATUS: Preferred alternative selected. Not approved by Commission - Project postponed.  
 PROJECT LIFE (YEARS): 50

FY	INITIAL COSTS						CONTINUING COSTS			
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED	ACTUAL
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.
1982										
1983	\$133,432	+ODFW <sup>2</sup>		\$133,058	+ODFW <sup>2</sup>		\$133,432	\$133,058		
1984	92,195	+ODFW		56,064	+ODFW		92,195	56,064		
1985	100,905			49,379			100,905	49,379		
1986		\$1.9-4.5 mil <sup>3</sup>								
OTHER <sup>1</sup>										
<b>TOTAL</b>	<b>\$326,532</b>	<b>+ODFW</b>		<b>\$238,501</b>	<b>+ODFW</b>		<b>\$326,532</b>	<b>\$238,501</b>		<b>\$20-63k/year<sup>3</sup></b>

<sup>1</sup>Contributed Funds  
<sup>2</sup>ODFW budgets and costs not available.  
<sup>3</sup>Depending upon alternative selected.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%)		PREDICTED				ACTUAL			
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS	DISCOUNTED COSTS
				\$3.8-5.4 mil <sup>4</sup>					
<b>TOTAL</b>					<b>TOTAL</b>				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

<sup>4</sup>Includes construction, O+M and replacement costs discounted to first year of construction and over 50 years  
 Dependent upon alternative selected.

## SUMMARY

### 1. Abstract

Resource inventories of the White River drainage were conducted by USFS and ODFW in FY 1983 under project number 83-440. Design of alternatives and selection of preferred alternative to facilitate passage of anadromous fish over the falls was conducted by Ott Water Eng. in FY 1983 and 1984 under project number 83-450.

Studies to determine potential fishery benefits were still ongoing in 1984 and detailed results have not been published.

The NEPA and EA phases were scheduled for FY 1985 and construction was not anticipated before FY 1986-87.

ODFW conducted habitat surveys and fish passage studies in 1983 and published the results in: "Natural propagation and habitat improvement Vol. 1D - Oregon. White River Falls Passage." However, no proposals, work statements, budgets or actual costs were available in the BPA files for this portion of the project.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

No. Work statement, proposal and contract agreement for contract no. 12910 with ODFW were not available in BPA file.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

Natural, complete passage barrier.

##### 2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Yes. However, only pool area not total rearing area was given and estimates were confused by presence of potential, complete and partial barriers. A clear estimate of potential habitat with all barriers factored in was not given. Also, estimates of different portions of the drainage were done by ODFW and USFS. These two estimates were difficult to combine or reconcile.

D74

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Only with further refinement of categories labeled accessible and accessible with enhancement.

C. Fish

1. Were the target species clearly identified

Not specifically. Only as anadromous salmonids: steelhead, chinook, and coho.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No predictions given.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No predictions given.

4. Was hatchery supplementation discussed

Yes. Impacts to and from hatchery stocks were discussed

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Partially. ODFW contract costs missing
- b. Construction - Yes.
- c. Evaluation - No.
- d. Operation & Maintenance - Yes.
- e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

No estimates of benefits given.

D75

3. Was the time when the benefits would start determined

No estimates given.

4. Was the effective life of the project clearly stated

No, but was assumed as 50 years for present value analysis of costs. Analysis assumed borrowing construction capital at 11%, inflating future costs at 7% and discounting future costs at 3%.



SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-83BP39801  
 PROJECT NUMBER: 82-9  
 PROJECT NAME: Deer Creek Habitat Improvement, Annual Report 1982  
 SUBBASIN NAME: John Day River TARGET SPECIES: steelhead  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM X PASSAGE     PONDS      
 SIDE CHANNEL     RIPARIAN      
 BEGINNING DATE: 1982  
 ENDING DATE: 1983  
 PRESENT STATUS: Construction Complete  
 PROJECT LIFE (YEARS): 20

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL	PREDICTED		ACTUAL		
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982		\$22,760 <sup>2</sup>			\$22,760		\$22,760	\$22,760				
1983			\$24,785 <sup>3</sup>				24,785	23,714				
1984			19,324				19,081	19,324				
1985												
1986												
OTHER <sup>1</sup>												
<b>TOTAL</b>	<b>\$22,760</b>	<b>\$44,109</b>		<b>\$22,760</b>	<b>\$42,795</b>	<b>\$66,869</b>	<b>\$65,555</b>	<b>\$800/YEAR</b>				

<sup>1</sup>Contributed Funds

<sup>2</sup>\$1,732 for ODFW administration not included

<sup>3</sup>Cost of evaluation is 1/3 of total listed for Clear, Camp, and Deer Creek evaluation.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 7.0

PREDICTED					ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
0	\$0	\$0	\$22,760	\$22,760					
1-20			800/yr.	8,472					
2-20 <sup>4</sup>	13,552	130,845							
<b>TOTAL</b>		<b>\$130,845</b>		<b>\$32,232</b>	<b>TOTAL</b>				

DISCOUNTED BENEFITS : DISCOUNTED COSTS 4.2:1<sup>5</sup> . DISCOUNTED BENEFITS : DISCOUNTED COSTS    

<sup>4</sup>Beginning year not given in report. Determined as year 2 by back-calculation using total discounted benefits provided in evaluation report.

<sup>5</sup>B/C calculation taken from enhancement report.

## SUMMARY

### 1. Abstract

Twenty-two log or boulder structures and 100 boulders were installed in 3 miles of Deer Creek. Six structures installed in 1981 indicated success in increasing fish production, and these preliminary results caused installation of additional structures in 1982. Predictions of additional spawning gravel were calculated at the rate of 55 **yds<sup>2</sup>** per weir, 25 **yds<sup>2</sup>** per double log deflector, 13 **yds<sup>2</sup>** per single log deflector and 3 **yds<sup>2</sup>** per boulder. Average area per redd was estimated at 20 **yds<sup>2</sup>** in the summary, but changed to **30 yds<sup>2</sup>** in the conclusions section of the report.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all' documents available for review

Yes.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

No. Factors were listed as excessive water velocities and lack of pool and spawning area, but no justification, explanation or quantitative assessments were given.

##### 2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Spawning habitat was quantified, but not rearing.

##### 3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

only for spawning habitat. Effects of rearing habitat on population levels were not quantified.

#### C. Fish

##### 1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Changes in spawning habitat only.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Yes - used 4% based on Round Butte Hatchery records and 20% decrease for mortality at John Day Dam resulting in total mortality of 3.2%.

4. Was hatchery supplementation discussed

No. Increases in survival due to greater quality and quantity of spawning habitat were assumed to provide the additional seeding.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design No.
- b. Construction - Yes.
- c. Evaluation - Yes.
- d. Operation & Maintenance Yes.
- e. Other Contributed Funds No.

2. What was the dollar value of the target species based on

Meyer 1982. Sport caught steelhead = \$214; spawning steelhead = \$359. However, the economic value of fish was double counted. Value per spawner in the Meyer estimates is based on total value of sport and commercial catch divided by the number of spawners. Totaling the value of sport catch and spawners double counts the sport catch value.

3. Was the time when the benefits would start determined

No - Appear to use year 2 for benefits discounting.

4. Was the effective life of the project clearly stated

No - 20 years was used for benefits discounting.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-83BP11889  
 PROJECT NUMBER: 83-384  
 PROJECT NAME: Murderers and Deer Creek Habitat Improvement  
 STREAM(S): Murderers and Deer Creeks  
 SUBBASIN NAME: South Fork John Day River  
 LOCATION: STATE: Oregon  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
                   SIDE CHANNEL      RIPARIAN       
 RELATED PROJECT NUMBERS:  
 TARGET SPECIES: steelhead trout  
 COUNTY: Grant  
 PUBLISHED IN: Natural propagation and habitat improvement. Vol. 1 - Oregon Final  
                   and Annual Reports 1982/83 (April 1984).  
 CONTRACTOR: Malheur National Forest      TYPE: FEDERAL X STATE      TRIBE      PRIVATE       
 PROJ. LEADER: Brady Green  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE: March 15, 1983 (?)  
 COMPLETION DATE: August 26, 1983  
 PRESENT STATUS: Complete  
 PROJECT LIFE (YEARS): 30

D82

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT</u> <u>CONDITIONS</u>	<u>POST-PROJ.</u> <u>CONDITIONS</u>	<u>PREDICTED</u> <u>CHANGE</u>	<u>ACTUAL</u> <u>CHANGE</u>	<u>FISH PRODUCED PER</u> <u>UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	<u>44,023</u>	-----	-----	<u>9,265</u>	<u>0.84 (smolts)</u>	-----
STREAM LENGTH (MILES)	<u>7.13</u>	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	<u>23/77</u>	<u>44/56</u>	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>			
SMOLT:	steelhead	-----	<u>1,9175</u>	-----	<u>7,760</u>
ADULT:	steelhead	-----	<u>422</u>	-----	<u>155</u>

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-83BP11889  
 PROJECT NUMBER: 83-384  
 PROJECT NAME: Murderers and Deer Creeks, Habitat Improvement  
 SUBBASIN NAME: South Fork John Day River TARGET SPECIES: steel head trout  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM X PASSAGE     PONDS      
 SIDE CHANNEL     RIPARIAN      
 BEGINNING DATE: March 15, 1983 (?)  
 ENDING DATE: August 26, 1983  
 PRESENT STATUS: Complete  
 PROJECT LIFE (YEARS): 30

PLAN/DGN.	INITIAL COSTS						CONTINUING COSTS		
	PREDICTED (BUDGET)		ACTUAL (INVOICES)		TOTAL		PREDICTED	ACTUAL	
	CONST .	EVAL .	PLAN/DGN.	CONST .	EVAL.	PRED.	ACTUAL	OPER&MAINT MONIT.	OPER&MAINT MONIT.
1982									
1983	<b>\$73,515</b>			1	64,114	<b>\$73,515</b>	\$64,114		
1984									
1985									
1986									
<b>OTHER*</b>	2,600			1,500		2,600	1,500		
====Z=	=====	=====	=====	=====	=====	=====	=====	=====	=====
<b>TOTAL</b>	476,115			\$65,614		<b>\$76,115</b>	965,614		

\*Contributed Funds from USFS  
 \*Annual Report 1983 cost summary does not include final invoice of \$604.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 4

PREDICTED				ACTUAL			
YEARS	DISCOUNTED	DISCOUNTED		YEARS	DISCOUNTED	DISCOUNTED	
OCCURRING	BENEFITS	BENEFITS	COSTS	OCCURRING	BENEFITS	BENEFITS	COSTS
0	\$0	\$0	\$65,010				
5-30	\$18,309/yr.	9250,140					
-----		=m=w=====e=		-----	-----a-----		
TOTAL				TOTAL			

DISCOUNTED BENEFITS : DISCOUNTED COSTS 3.83:1 DISCOUNTED BENEFITS : DISCOUNTED COSTS       

\*Benefits and costs taken from Annual Report 1983 using actual costs at date of report.

SUMMARY

1. Abstract

BPA and U.S. Forest Service funds were used to install 118 log weirs and 185 boulders in 7.13 miles of Murderers, Tex, and Deer Creeks. These installations were calculated to add 9,265 sq. yd. of habitat area to the streams and produce a gain of 7,760 summer steelhead smolts.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

B. Habitat

1. Were limiting factors discussed in detail

The primary objective was to increase and improve quality of pool habitat. This implies that lack of good pools was considered a limiting factor. However, limiting factors were not explicitly discussed.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Habitat was quantified as **ft.<sup>2</sup>** of pool area, total surface area and miles of stream.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. Only an increase of pool area was available.

C. Fish

1. Were the target species clearly identified

Summer steel head was the only species referred to in the report.

D84

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Not clearly. Increased production and habitat capability indices developed by ODFW and the Malheur Forest were stated as the base for these predictions, but the indices were not explained.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

The indices referred to in C.2. above apparently used 2% survival of smolts to adults and 33% adults surviving to spawn.

- 4 Was hatchery supplementation discussed

No.

D Economic

1. Were all project costs included in documents

- a. Planning/Design - Not separately.
- b. Construction - Yes.
- c. Evaluation - No.
- d. Operation and Maintenance - No.
- e. Contributed Funds - Yes.

2. What was the dollar value of the target species based on

Meyer (1982) and 2:1 catch to escapement ratio; \$359 per spawning steelhead.

3. Was the time when the benefits would start determined

No. Used 5 years after installation for benefits discounting.

4. Was the effective life of the project clearly stated

30 years was used for B/C ratios otherwise no project duration estimate was made.

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SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER DE-AI79-83DP11855  
 PROJECT NUMBER: 84-8/83-395 RELATED PROJECT NUMBERS: **82-9;** 83-396  
 PROJECT NAME: North Fork John Day Side Channel Habitat Improvement STREAM (S): North Fork John Day R.  
 SUBBASIN NAME: John Day River TARGET SPECIES: spring chinook  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM X PASSAGE — PONDS  
 SIDE CHANNEL X RIPARIAN  
 PUBLISHED IN: Natural propagation and habitat improvement Vol. I: Oregon. Annual and Final Reports 1984  
 (January **1986**).  
 CONTRACTOR: USFS - Umatilla N.F. TYPE: FEDERAL X STATE — TRIBE — PRIVATE —  
 PROJ. LEADER: John Andrews  
 SUBDASIN NUMBER:  
 EPA STREAM SEG-/MILE CODE: \_---- \_----- \_----- \_----- \_-----  
 STREAM ORDER:  
 BEGINNING DATE: February 1, 1983  
 COMPLETION DATE: March 31, 1985  
 PRESENT STATUS: Construct ion Complete  
 PROJECT LIFE (YEARS): 20

D87

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA ( ACRES )	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*				
SMOLT:	spring chinook	-----	-----	-----	7,260 <sup>a</sup>	-----
ADULT:	spring chinook	-----	-----	-----	45 <sup>a</sup>	-----

\* SEE ATTACHED STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS  
 \* From FY 83 work only.

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI 79-83BP 11855  
 PROJECT NUMBER: 83-395/84-8  
 PROJECT NAME: North Fork John Day Side Channel Habitat Improvement  
 SUBBASIN NAME: John Day TARGET SPECIES: spring chinook  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM X PASSAGE — PONDS —  
 SIDE CHANNEL X RIPARIAN —  
 BEGINNING DATE: February 1, 1983  
 ENDING DATE: March 31, 1985  
 PRESENT STATUS: Construction Complete  
 PROJECT LIFE (YEARS): 20

FY	INITIAL COSTS						CONTINUING COSTS			
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED	ACTUAL
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT MONIT.	OPERGMAIN MONIT.
1982										
1983							547,420	446,600		
1984							31,240	31,240		
1985										
1986										
OTHER' (FY 79-83)							67,400	67,400		
TOTAL							<b>\$146,060</b>	\$145,240		

'Contributed Funds

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 4

PREDICTED		DISCOUNTED		ACTUAL	
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	YEARS OCCURRING	BENEFITS
0	\$0	\$0	946,600		
1-20	24,750	336,360	\$46,600		
TOTAL				TOTAL	

DISCOUNTED BENEFITS : DISCOUNTED COSTS 7.2: 12

DISCOUNTED BENEFITS : DISCOUNTED COSTS       

<sup>a</sup>B:C figures were taken from 1983 Annual Report and used actual costs. A separate B:C estimate was not- done in the 1984 Annual Report for FY 84 work.

SUMMARY

1. Abstract

Dredge mining in the North Fork John Day River has caused channel morphology which results in dewatering of side channels and stranding of spring chinook fry at low flow. The main purpose of this project was to change the stream channel and add instream structures to maintain year-round flows in side channels and provide improved rearing habitat for juveniles in the mainstem and side channels.

During FY 1979-81 the USFS funds were used to improve flow in the side channels and place an unspecified number of large boulders in the river.

During FY 1983 BPA funds were utilized to place 492 boulders in the North Fork John Day and to excavate and construct hydraulic control structures in and around six side channels.

During FY 1984 BPA funds were utilized to place 250 boulders in side channels, excavate and construct hydraulic controls in and around three side channels and construct one boulder weir and two log weirs in the side channels.

Benefits predicted for the FY 1983 work were based on the estimated smolt production per improvement type and the quantity of each improvement type. No method was given in the FY 1984 Annual Report benefits prediction, however, the total increase in smolts is identical to that reported in the FY 1983 Annual Report. This is in contrast to the difference in quantity and type of improvements performed between the two years.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

E. Habitat

1. Were limiting factors discussed in detail

No. Rearing habitat was stated as limiting, but no justification was provided.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

C. Fish

1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No. They were based on estimated number of smolts produced per instream structure with no justification given for the estimates.

Also the same total estimate of smolt change was used in the 1983 and 1984 Annual Reports despite differences in number and type of structures constructed in 1983 and 1984.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

The 1983 and 1984 Annual Reports used 0.625% survival from smolt to spawner. No estimates of survival rates were given in the work statement predictions.

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Not separately,  
b. Construction - Not separately.

- c. Evaluation - Not separately.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - Yes.

2. What was the dollar value of the target species based on

\$550 per chinook spawner. Meyer 1982.

3. Was the time when the benefits would start determined

No - used year 1 for benefits discounting.

4. Was the effective life of the project clearly stated

No - used 20 years for benefits calculation.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP17041  
 PROJECT NUMBER: 83-473  
 PROJECT NAME: Cottonwood Creek  
 SUBBASIN NAME: John Day River  
 LOCATION: STATE: Oregon  
 TYPE OF PROJECT: INSTREAM X PASSAGE P O N D S  
 SIDE CHANNEL RIPARIAN

RELATED PROJECT NUMBERS:  
 STREAM(S) : Cottonwood Creek  
 TARGET SPECIES: summer steelhead  
 COUNTY: Grant

PUBLISHED IN: Natural propagation & habitat improvement Vol. I: Oregon. Annual & Final Reports 1984 (January 1986).  
 CONTRACTOR: Bureau of Land Management - Burns TYPE: FEDERAL X STATE — TRIBE — PRIVATE —  
 PROJ. LEADER: Ron Wiley  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE: April 1, 1984  
 COMPLETION DATE: March 31, 1985  
 PRESENT STATUS: Construction Complete  
 PROJECT LIFE (YEARS): 25

D92

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED' CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	<u>1,130-1,700</u>	-----	<u>0.8-2</u>	(SMOLTS)
REARING AREA (SQ. YD.)	-----	-----	<u>350-439</u>	-----	<u>5.1-6.3</u>	(SMOLTS)
TOTAL USABLE AREA (SQ. YD. 1	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD. 1	-----	-----	-----	-----	-----	--w--m--
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C-1	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*				
SMOLT :	summer steelhead	-----	-----	-----	<u>2,200</u>	-----
ADULT:	summer steel head	-----	-----	-----	<u>22</u>	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

1 Derived by taking habitat change per structure type as described in contractor's work statement and multiplying by the number of structures to be built.

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84BP17041  
 PROJECT NUMBER: 83-473  
 PROJECT NAME: Cottonwood Creek  
 SUBBASIN NAME: John Day River TARGET SPECIES: summer steelhead  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM X PASSAGE \_\_\_ PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: April 1, 1984  
 ENDING DATE: March 31, 1985  
 PRESENT STATUS: Construction Complete  
 PROJECT LIFE (YEARS): 25

D93

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983		\$22,108			\$19,284		\$22,108	\$19,284				
1984												
1985												
1986												
OTHER <sup>1</sup>												
TOTAL		\$22,108			\$19,284		\$22,108	\$19,284				

<sup>1</sup>Contributed Funds

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 4

PREDICTED				ACTUAL			
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS
0	\$ 0	\$ 0	22,108				
1-20	7,634	103,750					
TOTAL		\$103,750					

DISCOUNTED BENEFITS : DISCOUNTED COSTS 4.7:1<sup>2</sup>

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

<sup>2</sup>The yearly and discounted benefits are taken directly from the 1983 work statement. The yearly benefits were increased in the 1983 Annual Report to \$7,989 per year for a discounted total of \$123,380 and a B/C ratio of 5.6:1

SUMMARY

1. Abstract

Habitat surveys and population estimates determined that instream cover was the greatest limiting factor for summer steelhead production in Cottonwood Creek. Therefore, structures were placed in the creek to remedy the problem. These structures included: 16 log weirs, 7 single log deflectors, 2 double log deflectors, and 88 boulders. These numbers were derived by totaling the structures reportedly placed in eight separate reaches. These totals did not agree with those summarized by the author on page 3 of the 1984 Annual Report.

Benefits in numbers of steelhead smolts and adults were given, however, no explanation of the process used to derive the potential fish numbers was given. Also, benefit to cost ratios presented in the proposal and annual report did not agree with ratios calculated from the total benefit values and predicted or actual costs as presented in the reports.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

B. Habitat

1 Were limiting factors discussed in detail

No. A statement of limiting factors with no justification was given.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes. However, they were not summarized in the reports. The summary on this form (page 1) was completed using data included in the proposal.

D94

## c- Fish

1. Were the target species clearly identified  
Yes.
2. Were predictions of change in numbers of each target species based on quantified changes in habitat  
Yes. However, no justification or explanation of the assumptions were given.
3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult  
Yes. Steelhead smolt to adult survival of 3% was used
4. Was hatchery supplementation discussed  
No.

D. Economic

1. Were all project costs included in documents
  - a. Planning/Design - Not separated.
  - b. Construction - Yes.
  - c. Evaluation - No.
  - d. Operation & Maintenance - No.
  - e. Other Contributed Funds - No.
2. What was the dollar value of the target species based on  
Meyer 1982, \$359 per spanning steelhead and 2: 1 catch to escapement ratio.
3. was the time when the benefits would start determined  
No - used year 1 for discounted benefits calculation.

4. Was the effective life of the project clearly stated  
No - used 20 years in proposal and 25 years in Annual Report to discount benefits.

PAGE 5 F: 83-473

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16725 (also -83BP11897)  
 PROJECT NUMBER: 84-8/83-394 RELATED PROJECT NUMBERS: 83-395; 82-9  
 PROJECT NAME: Clear & Granite Creek Anadromous Fish Habitat Improvement  
 STREAM(S): Clear and Granite Creeks  
 SUBBASIN NAME: John Day TARGET SPECIES: spring chinook  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
 SIDE CHANNEL      RIPARIAN       
 PUBLISHED IN: Natural propagation and habitat improvement. Vol. I: Oregon. Final & Annual  
 Reports 1982/83 (April 1984). Annual and Final Reports 1984 (January 1986).  
 CONTRACTOR: USFS Umatilla N.F., and ODFW TYPE: FEDERAL X STATE X TRIBE      PRIVATE       
 PROJ. LEADER: USFS - John Andrews, ODFW - ?  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER: -----

BEGINNING DATE: 1982 COMPLETION DATE: March 31, 1985  
 PRESENT STATUS: Construction Complete PROJECT LIFE (YEARS): 20

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	321 <sup>1</sup>	5,196 <sup>1</sup>	4,875 <sup>1</sup>	-----	4.1 <sup>1</sup>	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

<sup>1</sup>FY 82 work only.

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*		
SMOLT:	spring chinook	-----	20,000	FY 82 BPA work only
	spring chinook	-----	3,050	FY 83 BPA work only
	spring chinook	-----	4,640	FY 84 BPA work only
ADULT:	spring chinook	-----	200	FY 82 BPA work only
	spring chinook	-----	20	FY 83 BPA work only
	spring chinook	-----	29	FY 84 BPA work only

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

D97

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: **DE-A179-84BP16725** (also -83BP11897)  
 PROJECT NUMBER: **84-8/83-394**  
 PROJECT NAME: Clear and Granite Cr. **Anadromous** Fish Habitat Improvement  
 SUBBASIN NAME: John Day TARGET SPECIES: spring chinook  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: **INSTREAM X** PASSAGE      FONDS       
 SIDE **CHANNEL**      RIPARIAN       
 BEGINNING DATE: 1982 ENDING DATE: March 31, 1985  
 PRESENT STATUS: Construction Complete PROJECT LIFE (YEARS): 20

FY	PREDICTED (BUDGET)			INITIAL COSTS			TOTAL		CONTINUING COSTS	
	PLAN/DGN.	CONST.	EVAL.	ACTUAL (INVOICES)			PRED.	ACTUAL	PREDICTED	ACTUAL
				PLAN/DGN.	CONST.	EVAL.				
1982		\$ 88,855		1 88,855			688,855	\$ 88,855		
1983		36,855	\$24,785 <sup>2</sup>	30,082	\$ 23,714 <sup>2</sup>		61,640	53,796		
1984		50,218	19,324	50,218	19,081		69,542	69,299		
1985										
1986										
OTHER=	\$2,700	180,000		2,700	180,000	182,700	182,700	182,700		
<b>TOTAL</b>	<b>\$2,700</b>	<b>8355,928</b>	<b>\$44,109</b>	<b>92,700</b>	<b>9349,155</b>	<b>\$42,795</b>	<b>\$402,737</b>	<b>6394,650</b>	<b>13,000</b> /year	

D98

<sup>1</sup>Contributed Funds

<sup>2</sup>Evaluation costs are 1/3 of the total listed for Camp, Deer, and Clear Cr. in John Day R. project # 82-9.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 4

YEARS OCCURRING	BENEFITS	PREDICTED <sup>2</sup>		ACTUAL	
		DISCOUNTED BENEFITS	DISCOUNTED COSTS	DISCOUNTED BENEFITS	DISCOUNTED COSTS
FY 82 0	\$0	\$0	\$88,855	988,855	
1-20	110,000	1,495,000	29,323	29,323	
FY 83 0	0	0	50,218	50,218	
1-20	11,000	149,494			
FY 84 0	0	0			
1-20	15,950	216,766			
<b>TOTAL</b>		<b>\$1,861,260</b>		<b>\$168,396</b>	

DISCOUNTED BENEFITS : DISCOUNTED COSTS 16.8: 1 FY82  
5.1: 1 FY83  
4.3: 1 FY84

DISCOUNTED BENEFITS : DISCOUNTED COSTS     

"As presented in the FY 1982-84 Annual Reports.

## SUMMARY

### Abstract

Habitat improvements were implemented in Clear and Granite Creeks from 1979 through 1984. The USFS initiated work in 1979 and began using BFA funds in FY 1982. A total of 4182,700 in USFS funds were spent through FY 1982, but no estimates of funds contributed by USFS after 1982 were available.

During FY 1982 BPA funds were utilized to serve and place 6,500 cubic yards of gravel in the creeks and stockpile another 3,500 cubic yards of sieved gravel for future use.

During FY 1983 BPA funds were utilized to place 550 boulders in Clear Creek and 50 boulders in Granite Creek. Also, 450 cubic yards of riprap were placed on 400 feet of stream bank: 200 yds on the Clear Creek Channel change (RM 4.5) and the remainder as deflectors at 49 bank erosion sites. A total of 500 cubic yards of spawning gravel were placed at 25 sites and 40, 10-15 ft. long, with low poles and 40 large hardwood clumps were planted at streamside locations disturbed by construction.

During FY 1984 BPA funds were utilized: to place 2,300 cubic yards of riprap at 71 sites; to place 700 cubic yards of spawning gravel at 14 sites in Clear Creek; to construct seven rock weirs; to install 74 large boulders; and plant 800 hardwood clumps and cuttings.

Population estimates of juvenile chinook salmon rearing in Clear Creek were made by ODFW from 1979-81 and in 1983. A decrease in abundance was observed between the mean for the 1979-81 period and the 1983 sampling. This difference was attributed to factors other than the habitat improvements done in 1982.

## 2. Comments

### A. Availability of Documents

#### 1. Were all documents available for review

No. 1979-1982 USFS costing and project description documents were not available. 1982 BFA contract agreement with ODFW was not available.

B. Habitat

1. Were limiting factors discussed in detail

No. Dredging activities in the 1950's were cited as removing "major portions of spawning gravel" and changing the creek. However, no actual discussion of a determination of limiting factors was given.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Spawning habitat was quantified in a 1980 survey  
Rearing habitat was not addressed.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. It appears that smolt production was based on habitat changes in some manner, but sufficient detail to allow understanding of the methods was not provided.

C. Fish

1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Possibly (see B.3.).

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Yes.

1982 Annual Report: 1.0% smolt to spawner survival  
1983 and 1984 Annual Reports: 0.625%

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all Project costs included in documents
  - a. Planning/Design - separated out for USFS funds but not for BPA funds.
  - b. Construction - Yes.
  - c. Evaluation - Yes.
  - d. Operation & Maintenance - An estimate was made in the evaluation report.
  - e. Other Contributed Funds - Yes.
2. What was the dollar value of the target species based on

FY 1983 work statement: 134.80 per commercial catch. \$56.55/RVD

1982, 1983 & 1984 Annual Reports: \$550 per chinook spawner. (Meyer 1982)
3. Was the time when the benefits would start determined

No. Appeared to be year 1 for benefit discounting.
4. Was the effective life of the project clearly stated

No. Benefits were discounted over a 20 year period.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER:  
 PROJECT NUMBER: 84-8  
 PROJECT NAME: N.F. John Day River Habitat Enhancement  
 SUBBASIN NAME: John Day River  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM \_\_\_\_\_ PASSAGE \_\_\_\_\_ PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_

RELATED PROJECT NUMBERS:  
 STREAM(S): Desolation Creek  
 TARGET SPECIES:

PUBLISHED IN:  
 CONTRACTOR: TYPE: FEDERAL \_\_\_\_\_ STATE \_\_\_\_\_ TRIBE \_\_\_\_\_ PRIVATE \_\_\_\_\_

PROJ. LEADER:  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS: Postponed - not implemented prior to FY 1985  
 PROJECT LIFE (YEARS):

D102

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT CONDITIONS</u>	<u>POST-PROJ. CONDITIONS</u>	<u>PREDICTED CHANGE</u>	<u>ACTUAL CHANGE</u>	<u>FISH PRODUCED PER UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
JUVENILE:	-----	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP17460  
 PROJECT NUMBER: 84-21  
 PROJECT NAME: John Day Habitat Improvement Project  
 SUBBASIN NAME: John Day River  
 LOCATION: STATE: Oregon  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
                   SIDE CHANNEL      RIPARIAN X  
 PUBLISHED IN: No Reports.  
 CONTRACTOR: ODFW TYPE: FEDERAL      STATE X TRIBE      PRIVATE       
 PROJ. LEADER: Errol Claire  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: July 1, 1984  
 COMPLETION DATE: September 30, 1988  
 PRESENT STATUS: Ongoing  
 PROJECT LIFE (YEARS): Not given.

D103

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT CONDITIONS</u>	<u>POST-PROJ. CONDITIONS</u>	<u>PREDICTED CHANGE</u>	<u>ACTUAL CHANGE</u>	<u>FISH PRODUCED PER UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	<u>80</u>	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	<u>25</u>	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>	
SMOLT:	summer steelhead	-----	<u>220,000<sup>1</sup></u>
	spring chinook	-----	<u>625,000<sup>1</sup></u>

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

<sup>1</sup> FROM FY 1985-1988 work statement.

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84BP17460  
 PROJECT NUMBER: 84-21  
 PROJECT NAME: John Day Habitat Improvement Project (Mainstem Middle Fork, North Fork)  
 SUBBASIN NAME: John Day River TARGET SPECIES: spring chinook, summer steelhead trout  
 LOCATION: STATE: Oregon COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE \_\_\_ PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: July 1, 1984  
 ENDING DATE: September 30, 1988  
 PRESENT STATUS: ongoing  
 PROJECT LIFE (YEARS):

40104

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984	\$149,656			\$84,346			\$149,656	\$84,346				
1985		\$527,940		65,310			527,940	174,245 <sup>2</sup>				
1986		428,898					428,898	348,385 <sup>2</sup>				
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	\$149,656	\$956,838		\$149,656			\$1,106,494	\$606,976 <sup>3</sup>				

<sup>1</sup>Contributed Funds

<sup>2</sup>Detail insufficient to allow separation of actual costs into plan/dgn or const.

<sup>3</sup>As of 7/86

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) \_\_\_\_\_

PREDICTED					ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

SUMMARY

1. Abstract

The work scheduled for FY 1984 consisted of planning and design only. The ODFW was to contact other agencies and landowners, survey stream habitat, design projects and prioritize projects. No implementation was scheduled before FY 1985. By December 31, 1984 aerial survey of the entire project area had been made and estimates of priorities for 1985 implementation projects made. Personal communication was made with 10 landowners and groundwork laid for legal agreements to accomplish the planned work on their properties.

Baseline habitat measurements were made on 8 miles of stream for future comparison with post-project conditions. Amounts of riparian fencing and location and types of instream structures needed were determined.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

B. Habitat

1. Were limiting factors discussed in detail

No. Many possible reasons were given for low population levels, but none were identified or discussed as limiting.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Habitat quantity was not discussed.

3. Were Predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. (see B.2.)

D105

C. Fish

1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No. Predictions were based on a report entitled: "Smolt production - Oregon forests: Malheur. National Forest, August 29, 1980". This report apparently estimates smolt production under existing conditions and under full seeding with habitat enhancement. The difference between these two figures is the predicted smolt increase from project implementation.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No prediction of adult numbers.

4. Was hatchery supplementation discussed

No.

D. Economic

1 Were all project costs included in documents

- a. Planning/Design - Yes
- b. Construction - Yes. Not separated for actual costs.
- c. Evaluation - No.
- d. Operation & Maintenance -No.
- e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

Not done.

3. Was the time when the benefits would start determined

Not done-

4. Was the effective life of the project clearly stated

Not done.

PAGE 5 F: 84-21

D107

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16064  
 PROJECT NUMBER: 84-22  
 PROJECT NAME: E. Fork Beech & Canyon Creeks Habitat Improvement Project  
 STREAM(S): E. Fork Beech, Canyon & Middle Fork Canyon Creek  
 SUBBASIN NAME: John Day R.  
 LOCATION: STATE: Oregon TARGET SPECIES: summer steelhead  
 COUNTY: Grant  
 TYPE OF PROJECT: INSTREAM X PASSAGE \_\_\_ PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 PUBLISHED IN: Natural propagation and habitat improvement, Vol. I: Oregon Annual and Final Reports 1984 (January 1986).  
 CONTRACTOR: US Forest Service - Malheur TYPE: FEDERAL X STATE \_\_\_ TRIBE \_\_\_ PRIVATE \_\_\_  
 PROJ. LEADER: Brady Green  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE: March 15, 1984  
 COMPLETION DATE: January 31, 1984  
 PRESENT STATUS: Construction Complete  
 PROJECT LIFE (YEARS): 30

D108

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	9,472	-----	0.8	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	12 (total both streams)	-----	-----	-----
POOL/RIFFLE RATIO (Canyon Creek Only)	-----	-----	33-35%	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*			
SMOLT:	summer steelhead	-----	-----	7,750	-----
ADULT:	summer steelhead	-----	-----	51	- From annual report

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS



## SUMMARY

### 1. Abstract

Instream structures were placed in East Fork Beech Creek and Canyon Creek, tributaries to the John Day River, on the assumption that rearing habitat was limiting the production of summer steelhead smolts. A total of 107 single log weirs and 33 log deflectors was constructed and 320 boulders were placed in the stream%. The total pool area created by these structures was estimated using a theoretical average per structure and multiplying by the number of structures. Apparently an assumption also was made that 11 sq. ft. of rearing area would yield one steelhead smolt, however, this assumption was not stated. Therefore, an increase of 85,250 sq. ft. of pool area would result in an increase of 7,750 smolts produced by these creeks.

No further information is available concerning the method of construction, the location of structures or any assessment of their actual physical or biological impacts.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

No. The project agreement and documentation for expenditures beyond FY 1984 were missing.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

No. Rearing habitat was cited as limiting and stream surveys by USFS and ODFW were cited as the sources for this assumption.

##### 2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Spawning habitat was not quantified and pool area was used as the rearing area.

##### 3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. (see 8.2.)

D110

C Fish1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Apparently it was assumed that 11 sq. ft. of pool resulted in 1 smolt. This assumption was not clearly stated or justified.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Yes. A 2% smolt to adult survival rate and 2:1 catch to escapement ratio were used. No justification was given for these rates.

4. Was hatchery supplementation discussed

No.

D. Economic1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction Yes.
- c. Evaluation - No.
- d. Operation & Maintenance No.
- e. Other Contributed Funds No.

2. What was the dollar value of the target species based on

Meyer 1982 using 2:1 catch to escapement ratio and \$359 per spawning steelhead.

3. Was the time when the benefits would start determined

No. Apparently year 5 was used as the start date to calculate discounted benefits. This was not explicitly stated.

4. Was the effective life of the project clearly stated

No. A 30 Year project life was used to calculate benefits.





SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84-BP15807  
 PROJECT NUMBER: 83-434  
 PROJECT NAME: Channel Modification to the Lower Columbia River  
 SUBBASIN NAME: Umatilla TARGET SPECIES:  
 LOCATION: STATE: Oregon COUNTY: Umatilla  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: 1984  
 ENDING DATE: 1984  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D115

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984	\$22,345	\$320,980					\$343,325					
1985		97,716					97,716					
1986												
OTHER <sup>1</sup>												
TOTAL	\$22,345	\$418,696					\$441,041	\$431,095 <sup>2</sup>				

<sup>1</sup>Contributed Funds  
<sup>2</sup>Invoiced through September 1985.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION

DISCOUNT RATE (%) ___									
		PREDICTED					ACTUAL		
YEARS	DISCOUNTED	DISCOUNTED	DISCOUNTED	DISCOUNTED	YEARS	DISCOUNTED	DISCOUNTED	DISCOUNTED	
OCCURRING	BENEFITS	BENEFITS	COSTS	COSTS	OCCURRING	BENEFITS	BENEFITS	COSTS	
=====	=====	=====	=====	=====	=====	=====	=====	=====	
=====	=====	=====	=====	=====	=====	=====	=====	=====	
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

SUMMARY

1. Abstract

The purpose of this report was to summarize the modification of the channel downstream of Threemile Dam. The contract work consisted of excavation of 7,000 cubic yards of main channel, 100 cubic yards of miscellaneous rock excavations, construction of parking and haul roads, and diversion and care of water during construction activities. The Corps contractor started work in July 1984 and completed work in November 1984, except for a minor amount of additional channel excavation that would be done in 1985 or 1986.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes, the final report was reviewed.

B. Habitat

1. Were limiting factors discussed in detail

No.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Not applicable (N/A)

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

N/A

C. Fish

1. Were the target species clearly identified

N/A

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

N/A

D116

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

N/A

4. Was hatchery supplementation discussed

N/A

D. Economic

- 1 Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes, but \$12,862 was included in project number 83-834 (ODFW) for explosives personnel.
- c. Evaluation No.
- d. Operation & Maintenance N/A
- e. Other Contributed Funds

2. What was the dollar value of the target species based on

N/A

3. Was the time when the benefits would start determined

N/A

4. Was the effective life of the project clearly stated

N/A

D117

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP17463  
 PROJECT NUMBER: 83-436 RELATED PROJECT NUMBERS: 84-10; 83-834 (Corps); 83-834 (ODFW)  
 PROJECT NAME: Fish Passage Improvements at Three Mile Diversion Dam  
 STREAM(S): Umatilla River  
 SUBBASIN NAME: Umatilla TARGET SPECIES:  
 LOCATION: STATE: Oregon COUNTY: Umatilla  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN   
 PUBLISHED IN: Natural propagation and habitat improvement Volume I: Oregon, Annual  
 and Final Report 1984 (January 1986).  
 CONTRACTOR: Bureau of Reclamation TYPE: FEDERAL  STATE  TRIBE  PRIVATE   
 PROJ. LEADER:  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: June 1, 1984  
 COMPLETION DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D118

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

		<u>SPECIES</u>	
JUVENILE:	fall chinook fingerlings	In 1982-3.83 million released	
	spring chinook	0	
SMOLT:	fall chinook yearlings	Hatchery release since 1983-100,500-225,000	
	summer steelhead yearlings	Since 1980-17,500 to 60,500	
	summer steelhead smolt	200,000 planned release	
ADULT:	summer steelhead	1,800 ave.	+ 5,000 natural
	fall chinook	FEW	+12,000 natural
	spring chinook	-----	+ 1,000 natural

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84BP17463  
 PROJECT NUMBER: 83-436  
 PROJECT NAME: Fish Passage Improvements at Three Mile Diversion Dam  
 SUBBASIN NAME: Umatilla TARGET SPECIES:  
 LOCATION: STATE: COUNTY:  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: June 1, 1984  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET) <sup>2</sup>			ACTUAL (INVOICES)			TOTAL <sup>2</sup>		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984	\$120,000					\$54,402	\$120,000	\$54,402				
1985	274,000	\$2,985-8,280 million <sup>3</sup>				3,073	2.9-8.2mil <sup>4</sup>	34,073				
1986						44,541		44,541				
OTHER <sup>3</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
D119 TOTAL	\$120,000	\$2,985,000 - 8,280,000				\$133,016	3.1-8.4mil	\$133,016	\$52,000-66,000/yr.			

<sup>1</sup>Contributed Funds

<sup>2</sup>The budgets for hatchery contribution/supplementation were not included in the estimated costs.

<sup>3</sup>Depending on alternative selected.

<sup>4</sup>\$2,985-8,280 million.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION

DISCOUNT RATE (%)		PREDICTED					ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS		YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	
-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	
-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	
-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	
=====	=====	=====	=====	=====		=====	=====	=====	=====	=====	
TOTAL						TOTAL					

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

## SUMMARY

### 1. Abstract

This study was undertaken to provide a biological assessment of fish passage problems at Three Mile Falls Diversion Dam and to conduct a feasibility study of alternative plans to resolve passage problems. The report presents a description of the study area, fishery resources and problems relative to the dam, and alternative measures to resolve the problem. The development of the selected alternative would increase passage of steelhead, full chinook or spring chinook. Presently, about 1800 steelhead pass the dam each year. Fall chinook were eliminated with the construction of Three Mile Dam. No spring chinook have been observed since the early 1960's. The project would increase successful passage of steelhead adults from 75% to 95%; fall chinook adults, from 38% to 45%, spring chinook adults from 48% to 60%; spring chinook juveniles from 60% to 90%; steelhead juveniles from 75% to 90%; and fall chinook juveniles from 50% to 90%.

Flow augmentation from upstream reservoirs was considered as a possible further enhancement for passage if the preferred alternatives were implemented. Passage for juvenile steelhead, fall and spring chinook would increase from 90% to 95%; adult fall chinook would increase from 45% to 95% and adult spring chinook would increase from 60% to 95%.

Although not a detailed part of this report, long-term escapement goals were cited. These goals depend to some extent on channel and dam modification, but to a larger degree on supplementation from hatchery produced and naturally produced fish.

### 2 Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

Yes, but the alternative chosen was not identified.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

No. The factors affecting adult upstream movement and juvenile migration were not discussed in detail.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Not in this report.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

C. Fish

1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No.

4. Was hatchery supplementation discussed

Yes. The costs were not included in the report. The report only considered modifications to the ladder/dam facilities, including screens.

D. Economic

1. Were all project costs included in documents

a. Planning/Design - Yes, but other related project documents must be reviewed to compile all costs.

b. Construction - Yes, but it depended on alternatives selected; \$2,985,000-\$8,280,000.

c. Evaluation - No.

d. Operation & Maintenance - Yes, but it depended on alternatives selected, \$52,000-66,000

e. Other Contributed Funds - These were not discussed, but other activities such as hatchery construction for supplementation programs are necessary and referred to in documents. Also, costs for other federal, state, tribal entities appear to be accounted for only partially in other related projects.

2. What was the dollar value of the target species based on

Not determined

3. Was the time when the benefits would start determined

Not determined

4. Was the effective life of the project clearly stated

Not stated

D122

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP19130  
 PROJECT NUMBER: 83-834 RELATED PROJECT NUMBERS: 83-436; 84-10; 83-434(Corps)  
 PROJECT NAME: Evaluation of Lower Umatilla River Channel Modification below Three Mile Diversion Dam  
 STREAM(S): Umatilla  
 SUBBASIN NAME: Umatilla TARGET SPECIES: fall chinook  
 LOCATION: STATE: Oregon COUNTY: Umatilla  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN   
 PUBLISHED IN: Evaluation of lower Umatilla River channel modification below Three Mile Dam. Annual Report 1984 (May 1985), Annual Report 1985 (February 1986).  
 CONTRACTOR: Oregon Dept. Fish & Wildlife TYPE: FEDERAL  STATE  TRIBE  PRIVATE   
 PROJ. LEADER: Tony Nigro  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: September 1984  
 COMPLETION DATE: 1986  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D123

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*
JUVENILE:	-----	-----
SMOLT:	-----	-----
ADULT:	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-A179-84BP19130  
 PROJECT NUMBER: 83-834  
 PROJECT NAME: Evaluation of Lower Umatilla River Channel Modification  
 SUBBASIN NAME: Umatilla TARGET SPECIES: fall chinook  
 LOCATION: STATE: Oregon COUNTY: Umatilla  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: September 1984  
 ENDING DATE: 1986  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D124

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983			<sup>2</sup>									
1984		\$12,862	\$58,612	\$9,037			\$71,474	\$9,037				
1985			99,272	56,788			99,272	56,788				
1986				53,099				53,099				
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL		\$12,862	\$157,884	\$118,924			\$170,746	\$118,924				

<sup>1</sup>Contributed Funds

<sup>2</sup>Labor and travel/per diem for licensed personnel for use of explosives.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) \_\_\_

YEARS OCCURRING	BENEFITS	PREDICTED		YEARS OCCURRING	BENEFITS	ACTUAL	
		DISCOUNTED BENEFITS	DISCOUNTED COSTS			DISCOUNTED BENEFITS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====
TOTAL				TOTAL			

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

## SUMMARY

### 1. Abstract

This study was undertaken in 1984 to evaluate the adequacy of channel modifications below Three Mile Dam to enhance passage of steelhead trout. Of 34 steelhead marked with T-anchor tags or radio transmitters and released in the lower river, only 4 moved upstream through all channel modifications and migrated to the dam and ladder. Two other steel head moved upstream through some of the channel modification but did not migrate to the dam. The results of the study were inconclusive because of the few fish tagged and physical conditions encountered during the study which were high flows, cold water, and high turbidity.

The objective of the second year (1985) of the study was to evaluate the passage of fall chinook salmon. However, sampling of returning adults was discontinued in November 1985 because insufficient numbers were returning to the river to allow evaluation. The results were, therefore, inconclusive.

The studies undertaken in 1985 did not consider steelhead. Instead, the movements of the 1981 and 1982 fall chinook broods of upriver brights returning to the Umatilla River were monitored to identify minimum flows required for passage and flows at which passage occurs. The study was terminated on November 15 due to inadequate returns of fish. Stream flows were monitored through December 31 to document flow conditions present when returning adults were anticipated. Thus, an evaluation of channel modifications was not possible.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

Yes.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

Yes. The limiting factor appears to be reduced flow because of irrigation diversions. The basis for channel modifications was because of a series of bedrock drops and blind channels which impeded

passage at flows less than 200 CFS. However, the experimented data on which this was based were not presented.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Not applicable (N/A)

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

N/A

C. Fish

1. Were the target species clearly identified

Summer steelhead and fall chinook.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No predictions were made regarding habitat.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

N/A

4. Was hatchery supplementation discussed

Yes. Summer steelhead, tule fall chinook, and upriver bright fall chinook were mentioned.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - These were included in related projects.

- b. Construction - These were included in related documents.

- c. Evaluation Yes

- d. Operation & Maintenance No.

D126

e. Other Contributed Funds - Funds for design construction were included under other project numbers.

2. What was the dollar value of the target species based on

N/A

3. Was the time when the benefits would start determine4

Yes, the authors thought there would be sufficient fish for an evaluation from the 1982 planting.

4. Was the effective life of the project clearly stated

**No.**

D127

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP18008  
 PROJECT NUMBER: 84-10  
 PROJECT NAME: A Comprehensive Plan for Rehabilitation of Anadromous Fish Stock in the Umatilla River Basin  
 STREAM(S):  
 SUBBASIN NAME: Umatilla  
 LOCATION: STATE: Oregon  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE \_\_\_ PONDS \_\_\_ PLAN/INVENTORY x  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 PUBLISHED IN: Natural propagation and habitat improvement, Volume I: Oregon, Annual and Final Report 1984 (January 1986).  
 CONTRACTOR: Oregon Department of Fish & Wildlife TYPE: FEDERAL x STATE \_\_\_ TRIBE \_\_\_ PRIVATE \_\_\_  
 PROJ. LEADER: Raymond Boyce  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D128

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT CONDITIONS</u>	<u>POST-PROJ. CONDITIONS</u>	<u>PREDICTED CHANGE</u>	<u>ACTUAL CHANGE</u>	<u>FISH PRODUCED PER UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
ADULT:	summer steelhead	-----	<u>1,861<sup>1</sup></u>	<u>2,965-5,229</u>	<u>1,104-3,368<sup>2</sup></u>	-----
	fall chinook	-----	<u>--</u>	<u>5,204-11,920</u>	<u>5,204-11,920</u>	-----
	spring chinook	-----	<u>--</u>	<u>603-2,460</u>	<u>603-2,460</u>	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

<sup>1</sup> Average for 1966/67-1982/83

<sup>2</sup> The ranges reflect the different alternatives

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84BP18008  
 PROJECT NUMBER: 84-10  
 PROJECT NAME: A Comprehensive Plan for Rehabilitation of Anadromous Fish Stocks in the Umatilla River Basin  
 SUBBASIN NAME: Umatilla TARGET SPECIES:  
 LOCATION: STATE: Oregon COUNTY: Umatilla  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE \_\_\_ FONDS \_\_\_ PLAN/INVENTORY X  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D129

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984	\$40,022 <sup>2</sup>							\$36,744 <sup>2</sup>				
1985		\$43,057,450		\$136,084,450 <sup>3</sup>								
1986												
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	\$40,022	\$43,057,450		\$136,084,450				\$36,744			\$445,831-480,932	

<sup>1</sup>Contributed Funds

<sup>2</sup>The predicted and actual planning/design costs for this report seem low for the amount of material presented. In addition, there were five cooperating agencies, but we do not have documents or costs for them. Also, we do not have the 5 year rehabilitation plan developed by the tribes and ODFW in 1984, or costs/reports by other agencies such as Bureau of Reclamation.

<sup>3</sup>The costs for power for the pumping alternatives and for hatcheries were not included.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) \_\_\_\_\_

PREDICTED					ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

## SUMMARY

### 1. Abstract

This project was a comprehensive plan for rehabilitation of anadromous fish stocks in the Umatilla River Basin. The stocks of primary interest are summer steelhead and fall and spring chinook. It was developed by the Oregon Department of Fish and Wildlife in cooperation with federal agencies and Indian tribes, and was intended as a supplement to the 5 year plan developed by the tribes and ODFW in 1984. The report discussed factors limiting anadromous fish production, including stream flow and temperature, passage restrictions, lack of adequate fish screening at irrigation diversions, and degradation of riparian and instream habitat. The plan delineated flow enhancement and rehabilitation options and associated costs for specific projects. A benefit-cost analysis was not conducted.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

No. The 5-year rehabilitation plan was not NMFS reports on their use of the IFIM were not available.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

Yes, but the elimination of the factors that originally limited steelhead and chinook in the basin, such as low flow and diversions, may not result in the predicted returns. Other factors may prevent the ability to re-establish runs to levels predicted.

##### 2. Was the pro-project amount of habitat quantified in terms of spawning or rearing habitat

IFIM studies were used as a main technique. These studies were conducted in 1980 or 1981. Since then methodologies have improved. These studies should be reviewed to detect any major problems and to review suitability curves. In addition, relationship between fish and WUA was used to achieve maximum smolt production which appeared to be used to estimate required adults. These

estimates of adults seemed optimistic based on the information available for review.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

See: 2. above.

c. Fish

1. Were the target species clearly identified

Yes. Fall and spring chinook and summer steelhead were identified; coho was also mentioned but no extensive discussion followed.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

The IFIM was used but the study was not available for review.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from juvenile to adult

Yes, but the estimates did not provide confidence intervals and were based on studies primarily in other basins.

4. Was hatchery supplementation discussed

Yes. Hatchery releases were discussed. The success of the program depends on extensive hatchery supplementation since natural runs are very low especially for chinook.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Most appear to be included in other reports under the same contract 84-10 (see: c. below).

- b. Construction - Yes.

- c. Evaluation - No evaluation costs were identified but the need for evaluation was noted.
- d. Operation & Maintenance - Yes, but costs for hatcheries did not appear to be included; also, the cost of power for the pumping alternative was not included.
- e. Other Contributed Funds - There appeared to be considerable effort by many agencies and references to other studies in the planning stage.

2. What was the dollar value of the target species based on

Value was not placed on fish and a benefit/cost analysis was not done.

3. Was the time when the benefits would start determined

Times were included for implementation and completion of each project. Also, time to and amount of adult fish for a number of hatchery releases was delineated.

4. Was the effective life of the project clearly stated

No. Channel and dam modifications have long-term benefits if they work, but instream or riparian work will be considerably shorter. Effective life in terms of years was not included.

D132

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-83BP11898  
 PROJECT NUMBER: 83-392  
 PROJECT NAME: Peavine Creek Spawning Habitat Improvement  
 SUBBASIN NAME: Grande Ronde River  
 LOCATION: STATE: Oregon  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
 SIDE CHANNEL      RIPARIAN X  
 PUBLISHED IN: Natural propagation and habitat improvement, Vol. 1 Oregon, Annual & Final Reports  
 1984 (January 1986).  
 CONTRACTOR: USFS - Wallowa-Whitman  
 PROJ. LEADER: Rod Miller  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: January 23, 1984  
 COMPLETION DATE: March 31, 1985  
 PRESENT STATUS: Ongoing (?)  
 PROJECT LIFE (YEARS): 60

RELATED PROJECT NUMBERS:  
 STREAM(S): Peavine Creek  
 TARGET SPECIES: summer steelhead  
 COUNTY: Wallowa

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	35% of potential	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	14% pool	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES) Project Area	-----	-----	4.5	4.5	-----	-----
POOL/RIFFLE RATIO	-----	50/50	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	2 <sup>1</sup> ;2.75 <sup>2</sup>	2 <sup>1</sup> ;2.75 <sup>2</sup>	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

<sup>1</sup>Planted  
<sup>2</sup>Fenced

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*		
ADULT:	steelhead spawners	ST.56	-----	-----
	steelhead catch		-----	-----
			102	-----
			153	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

D133

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-A179-83BP11898  
 PROJECT NUMBER: 83-392  
 PROJECT NAME: Peavine Creek Spawning Habitat Improvement  
 SUBBASIN NAME: Grande Ronde River TARGET SPECIES: summer steelhead  
 LOCATION: STATE: Oregon COUNTY: Wallowa  
 TYPE OF PROJECT: INSTREAM X PASSAGE     PONDS      
                   SIDE CHANNEL     RIPARIAN X  
 BEGINNING DATE: January 23, 1984  
 ENDING DATE: March 31, 1985  
 PRESENT STATUS: Ongoing (?)  
 PROJECT LIFE (YEARS): 60

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983							\$73,700 <sup>2</sup>	\$75,301 <sup>2</sup>				
1984												
1985												
1986												
OTHER <sup>1</sup>						2,000	2,000					
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL							\$75,700	\$77,301				

<sup>1</sup>Contributed Funds

<sup>2</sup>Sufficient detail was not available to separate total predicted or actual costs into plan/dgn., const., or eval.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 4

YEARS OCCURRING	BENEFITS	PREDICTED		ACTUAL	
		DISCOUNTED BENEFITS	DISCOUNTED COSTS	DISCOUNTED BENEFITS	DISCOUNTED COSTS
0	\$0	\$0	\$737,000	\$737,000	
1-59	--	--	\$1,000/yr.	22,528	\$75,301
10-60	20,000/yr.	290,252			
30			31,000	9,558	
=====		=====	=====	=====	=====
TOTAL		\$290,252	\$105,786		

DISCOUNTED BENEFITS : DISCOUNTED COSTS 2.7:1

DISCOUNTED BENEFITS : DISCOUNTED COSTS

SUMMARY

1. Abstract

The planned instream devices, riparian fencing and riparian planting, were completed as planned except for some fencing that is "progressing as planned". There have been no failures. All money assigned to the project has been expended plus \$1,602 added to cover an overrun. The project area comprises 4.5 miles of the 5.35 mile mainstem of Peavine Creek. It has the highest priority from the management agencies for enhancement treatment in the Grande Ronde system.

51 structures were installed, 75,000 plantings of willow, cottonwood, alder and apple seedlings were made, and 6.2 miles of fence constructed. A detailed monitoring plan for future implementation by the Forest Service was developed.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes. However, the balance sheet indicates an unidentified 94,529 sent somewhere for "resolution"

B. Habitat

1. Were limiting factors discussed in detail

High water temperature in summer was given as the primary limiting factor. ~~68°~~ F is considered optimum high temperature, but pre-project temperatures were not given.

2. Was the ore-proiect amount of habitat auantified in terms of spawning or rearina habitat

No.

3. were predicted changes in habitat auantified in terms of spawing or rearina habitat so that estimates of fish can be made

No. Estimates of increased numbers of adults were based on 1966 and 1980 redd counts applied to predicted improved conditions.

D135

C. Fish1. Were the target species clearly identified

Yes. Summer steelhead.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No. Estimates of potential redd numbers made from a ratio of current percent shading to future percent shading multiplied by the number of redds needed to achieve 1966 base year level. Assumed 2 adults per redd.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No smolt estimates made.

4. Was hatchery supplementation discussed

No.

D. Economic1. Were all project costs included in documents

a. Planning/Design Not specified.

b. Construction - Yes. No funds were specified for other phases although some were discussed.

c. Evaluation - No.

d. Operation & Maintenance - \$1000/year included in B/C calculations.

e. Other Contributed Funds - \$2,000 Forest Service for EA in FY 82

2. What was the dollar value of the target species based on

1975 ODFW data - Dollars spent by anglers at rate of \$30.80/day.

3. Was the time when the benefits would start determined

No. Used year 10 for benefits discounting.

4. Was the effective life of the Project clearly stated

**No.** Used 60 years for B/C calculations

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP17578  
 PROJECT NUMBER: 84-9 RELATED PROJECT NUMBERS: 84-25  
 PROJECT NAME: Grande Ronde Habitat Improvement - USFS  
 STREAM(S): Elk and Sheep Creek  
 SUBBASIN NAME: Grande Ronde River TARGET SPECIES: steelhead, chinook  
 LOCATION: STATE: Oregon COUNTY: Wallowa  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
 SIDE CHANNEL      RIPARIAN      INVENTORY X  
 PUBLISHED IN: Natural propagation and habitat improvement Vol. 1: Oregon, Annual & Final Reports 1984 (January 1986)  
 CONTRACTOR: USFS - Wallowa/Whitman TYPE: FEDERAL X STATE      TRIBE      PRIVATE       
 PROJ. LEADER: Michael Collette  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE: July 1, 1984  
 COMPLETION DATE: June 30, 1986  
 PRESENT STATUS: Ongoing (?)  
 PROJECT LIFE (YEARS):

D138

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	<u>44:56<sup>1</sup></u>	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	<u>2.9<sup>2</sup>:2.0<sup>1</sup></u>	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*			
SMOLT:	chinook	-----	-----	-----	<u>5905<sup>1</sup></u>
	steelhead	<u>ST56</u>	-----	-----	<u>1593<sup>1</sup></u>

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS  
<sup>1</sup>Sheep Creek only  
<sup>2</sup>Elk Creek only



## SUMMARY

### 1. Abstract

A detailed habitat inventory by 250 ft. segments was made on 3.15 miles of Sheep Creek and 4.36 miles on the Upper Grande Ronde. The field data sheets were included in an appendix. The information was used to recommend unspecified improvements.

Permanent cross sections (25) were "installed and read" in Sheep Creek for a basis for future monitoring after installation of devices. Electro-fishing was done (but no data were included in the reports) to estimate salmonid populations.

Smolt production estimates were based on fish numbers per structure and the installation of 123 structures and riparian planting of 10,000 lineal feet on Sheep Creek. The source of the production per structure data was: "environmental assessment for anadromous fish habitat enhancement on the Umatilla National Forest portion of the Umatilla drainage - Appendix VII".

Elk Creek work consisted of the installation of 40 structures within a one mile section including: log and gabion weirs and an "artificial" boulder.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

The 1984 Annual Report, the contract agreement and expenditure forms were available. Work statements and budgets for FY 84 and/or before were not available.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

No.

##### 2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Although the information to do so may be in the detailed habitat survey sheets, it has not been summarized in a useful form.

D140

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. (see B.2.)

C. Fish

1. Were the target species clearly identified  
Yes. Chinook salmon and steelhead trout.
2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Yes - on increased pool surface area per structure and fish per area from an EA on Umati 11 a Forest portion of Umatilla River Drainage.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No prediction of adults was made.

4. Was hatchery supplementation discussed

Not discussed, but mentioned as an assumption that use of hatchery supplementation would be a successful management practice.

D. Economic

1. Were all project costs included in documents
- a. Planning/Design - Yes, but not separately.
  - b. Construction - Yes, but not separately.
  - c. Evaluation - No.
  - d. Operation & Maintenance - No.
  - e. Other Contributed Funds - No.
2. What was the dollar value of the target species based on

No dollar values considered in this report.

D141

3. Was the time when the benefits would start determined

Not mentioned.

4. Was the effective life of the project clearly stated

Not mentioned.

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D142



SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16114  
 PROJECT NUMBER: 84-25 RELATED PROJECT NUMBERS: 84-9  
 PROJECT NAME: Grande Ronde Habitat Improvement Project: Joseph Creek Drainage  
 STREAMS: Elk and Swamp Creeks  
 SUBBASIN NAME: Joseph Creek TARGET SPECIES: summer steelhead  
 LOCATION: STATE: Oregon COUNTY: Wallowa  
 TYPE OF PROJECT: INSTREAM X PASSAGE \_\_\_ PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN X  
 PUBLISHED IN: Natural propagation and habitat improvement. Vol. 1: Oregon. Annual and  
 Final Reports 1984 (January 1986)  
 CONTRACTOR: ODFW TYPE: FEDERAL \_\_\_ STATE X TRIBE \_\_\_ PRIVATE \_\_\_  
 PROJ. LEADER: William T. Noll  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: July 1, 1984  
 COMPLETION DATE: June 30, 1985  
 PRESENT STATUS: Ongoing (?)  
 PROJECT LIFE (YEARS): 10+

D144

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	33.5	-----	15.7 (Adult)	-----
STREAM LENGTH (MILES)	15	-----	10 <sup>1</sup> ; 15 <sup>2</sup>	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

<sup>1</sup> Planting  
<sup>2</sup> Fencing

FISH PRODUCTION (NUMBERS)

ADULT:	SPECIES	CODE*	-----	-----	-----	-----
	summer steelhead	ST 56	-----	-----	525	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-A179-84BP16114  
 PROJECT NUMBER: 84-25  
 PROJECT NAME: Grande Ronde Habitat Improvement Project: Joseph Creek Drainage  
 SUBBASIN NAME: Joseph Creek TARGET SPECIES: summer steelhead  
 LOCATION: STATE: Oregon COUNTY: Wallowa  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
                     SIDE CHANNEL      RIPARIAN X  
 BEGINNING DATE: July 1, 1984  
 ENDING DATE: June 30, 1985  
 PRESENT STATUS: ongoing (?)  
 PROJECT LIFE (YEARS): 10+

D145

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984	\$112,067			\$16,536			\$112,067	\$16,536				
1985		\$147,164					147,164	71,852 <sup>2</sup>				
1986												
OTHER <sup>1</sup>												
TOTAL	\$112,067	\$147,164					\$259,231	\$88,388				

<sup>1</sup>Contributed Funds

<sup>2</sup>Allocation of these funds as Plan/Dgn. or Const. could not be determined from the documents.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%)     

PREDICTED				ACTUAL			
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====
TOTAL				TOTAL			

DISCOUNTED BENEFITS : DISCOUNTED COSTS     

DISCOUNTED BENEFITS : DISCOUNTED COSTS

## SUMMARY

### 1. Abstract

This project is to include private lands only on the subject streams: The FY 84 work was to be planning only. Only Elk and Swamp Creeks, tributaries of Joseph Creek were included. Accomplishments were: Promotion of land owner awareness and acceptance of the program; preparation of riparian lease agreements with land owners; design and layout of project areas. Riparian fencing areas (6.5 miles of stream length) were identified and staked.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

Work statement, cost estimates and expenditures, and the 1984 Annual Report were available. Much of the documentation continues on into succeeding fiscal years.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

No. It is addressed in the generalization that rearing habitat is limited by lack of deep pools and high temperatures occur due to lack of shade. An estimate was made for the whole project area (public and private ownership) that there is 28% shade cover over most streams and that it can be increased to 70%. Also estimated that pool/riffle ratio could be restored to 50r50.

##### 2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

12 miles of stream were surveyed and "...Habitat deficiencies identified" but the results were not reported or quantified.

##### 3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Not here. Estimates have been made for increased number of spawning adults from habitat improvement. These were 175 for Elk and 350 for

D146

Swamp Creek by 1984 based on improvements on private land only.

C. Fish

1. Were the target species clearly identified

Yes.

2. Were oredictions of change in numbers of each taraet species based on auantified changes in habitat

based on improved spawning and rearing conditions, but the specific conditions were not quantified in the report.

3. If the predicted change in numbers of fish was based on adults. were the survival rates clearly stated for conversion from smolt or iuvenile to adult

No. Change in numbers of spawning adults was given, but data on survival from juvenile or smolt were not included in the report.

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes. However, these costs were not relevant prior to FY 85.
- c. Evaluation - No.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - No.

2. What was the dollar value of the taraet species based on

Not included in this report. Other project documents have estimate5 for the whole Joseph Creek system.

D147

3. Was the time when the benefits would start determined

No estimate of benefits timing made.

4. Was the effective life of the project clearly stated

No estimate made.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16535  
 PROJECT NUMBER: 84-6/83-522 RELATED PROJECT NUMBERS: 83-7  
 PROJECT NAME: Upper Lochsa Habitat Improvement  
 STREAM(S): Crooked Fork & White Sand Creeks  
 SUBBASIN NAME: Clearwater River TARGET SPECIES: spring chinook, steelhead  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE X PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_  
 PUBLISHED IN: Natural propagation and habitat improvement. Volume II-Idaho. Annual  
 and Final Reports 1984 (January 1986). Also: Idaho habitat evaluation  
 for offsite mitigation. Annual Report 1984 (July 1985).  
 CONTRACTOR: USFS Clearwater National Forest TYPE: FEDERAL X STATE \_\_\_\_\_ TRIBE \_\_\_\_\_ PRIVATE \_\_\_\_\_  
 PROJ. LEADER: F.A. Espinosa  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS: FY 83 and 84 construction complete.  
 PROJECT LIFE (YEARS): Perpetuity

D149

HABITAT DESCRIPTION	PRE-PROJECT	POST-PROJ.	PREDICTED:	ACTUAL	FISH PRODUCED PER UNIT OF HABITAT	
	CONDITIONS	CONDITIONS	CHANGE	CHANGE	PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	<u>12,200</u>	-----	<u>4,495</u>	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	<u>377,000</u>	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	<u>16</u>	-----	-----	-----
POOL/RIFFLE RATIO	<u>36:64 Crooked Fork</u>	-----	-----	-----	-----	-----
	<u>25:75 White Sand</u>	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*			
SMOLT:	spring chinook	-----	-----	<u>27,000</u>	-----
	steelhead	-----	-----	<u>27,150</u>	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

† These numbers are for the FY 1984 barrier removal on Crooked Fork only.

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-A179-84BP16535  
 PROJECT NUMBER: 84-6/83-522  
 PROJECT NAME: Upper Lochsa River Habitat Improvement  
 SUBBASIN NAME: Clearwater River TARGET SPECIES: spring chinook, steelhead  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS: FY 83 and 84 construction complete  
 PROJECT LIFE (YEARS): Perpetuity

D150

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983		\$27,963 <sup>2</sup>			\$27,963 <sup>2</sup>		\$27,963	\$27,963				
1984		20,006 <sup>3</sup>	\$5,000		20,006 <sup>3</sup>	\$5,000	25,006	25,006	\$15,000 <sup>4</sup>		\$10,000 <sup>4</sup>	
1985												
1986												
OTHER <sup>1</sup>												
TOTAL		\$47,969	\$5,000		\$47,969	\$5,000	\$52,969	\$52,969	\$15,000		\$10,000	

<sup>1</sup>Contributed Funds

<sup>2</sup>FY 1983 costs: 1/2 of total listed for Lolo and Upper Lochsa.

<sup>3</sup>Construction costs for FY 1984 barrier removal on Crooked Fork

<sup>4</sup>Maintenance work done on FY 1983 structures in Crooked Fork and White Sand.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) \_\_\_

PREDICTED					ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_

## SUMMARY

### 1. Abstract

During FY 1983 a total of 198 conifer trees was felled and anchored (120 on Crooked Fork and 78 on White Sand Creek) and a total of 63 debris jams were anchored in both creeks. Ice jams totally removed 36 of the structures with live and anchored trees suffering the worst damage. Total failure rate for both debris and live trees was 20% in the first year. In a comparison of the number of trees felled and those actively scouring, 67% of the 198 trees were not scouring. The failure rate for anchored debris was 41%.

Stream surveys revealed that a total of twelve migration barriers blocked adult salmon and steelhead from .93 acres of spawning area and 78 acres of rearing area in upper Crooked Fork. At some flows partial summer steelhead passage was achieved. During FY 1984 a fish passage consultant was retained to establish drilling and blasting locations at the barriers. A total of 252 shot holes were drilled at the 12 barriers. In most cases rest pools were created at each barrier. However, problems were encountered at barrier #6 where the blast created a higher falls. Additional blasting created a jump pool, but natural scouring may deepen the pool. Some of the barriers will have to be re-evaluated to determine if additional work is needed to provide upstream passage of adult salmon and steelhead.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

Work statements, contract agreements, and expenditure summaries were not available for FY 1983. Only annual and evaluation reports were available.

All documents were available for FY 1984 Crooked Fork barrier removal.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

Limiting factors addressed by the FY 1983 work included: poor pool quality, lack of bank cover, poor pool/riffle ratio and low diversity. Chinook

D151

spawning habitat may also be limiting. Review of stream survey data was given as justification for these conclusions.

Also FY 1984 work dealt with falls and cataracts which precluded nearly all fish passage to upper Crooked Fork.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Estimates of habitat available upstream of the passage barrier were made.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes - See B-2.

C. Fish

1. Were the target species clearly identified

Yes. Spring chinook and summer steelhead.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Possibly, however, the source or method of calculation was not given.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No prediction of adults.

4. Was hatchery supplementation discussed

The potential was mentioned as a method to accelerate full usage of the area made available, but costs and implementation were not discussed.

D. Economic

1. Were all project costs included in documents

a. Planning/Design - No.

- b. Construction - Yes.
  - c. Evaluation - Yes.
  - d. Operation & Maintenance - For one year only.
  - e. Other Contributed Funds - None.
2. What was the dollar value of the target species based on  
No dollar values or B/C calculations were included.
3. Was the time when the benefits would start determined  
See D.2. above.
4. Was the effective life of the project clearly stated  
No implied a perpetuity.

D153

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16535  
 PROJECT NUMBER: 84-6 & 83-522  
 PROJECT NAME: Lolo Creek Habitat Improvement  
 SUBBASIN NAME: Clearwater River  
 LOCATION: STATE: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
                   SIDE CHANNEL      RIPARIAN       
 RELATED PROJECT NUMBERS: 83-7  
 STREAM(S): Lolo Creek  
 TARGET SPECIES: spring chinook, summer steelhead  
 COUNTY: Idaho  
 PUBLISHED IN: Natural propagation and habitat improvement. Vol. III: Idaho Annual and Final Reports 1982/83 (April 1984). Vol. II: Idaho. Annual and Final Reports 1984 (January 1986).  
                   Also: Idaho habitat evaluation for offsite mitigation record. Annual Report 1984.  
 CONTRACTOR: USFS - Clearwater N.F. TYPE: FEDERAL X STATE      TRIBE      PRIVATE       
 PROJ. LEADER: Al Espinosa, Jr.  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER: 7  
 BEGINNING DATE: 1983  
 COMPLETION DATE: 1988  
 PRESENT STATUS: FY 83 and 84 construction complete  
 PROJECT LIFE (YEARS):

DISA

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	48-68k	-----	58,000	-----	-----	-----
REARING AREA (SQ. YD.)	190-290k	-----	240,000	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	11	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	23:77	50:50	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*			
SMOLT:	spring chinook	-----	-----	10,000	-----
	steelhead	-----	-----	4,000	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84BP16535  
 PROJECT NUMBER: 84-6 & 83-522  
 PROJECT NAME: Lolo Creek Habitat Improvement  
 SUBBASIN NAME: Clearwater River TARGET SPECIES: spring chinook, summer steelhead  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
                   SIDE CHANNEL      RIPARIAN       
 BEGINNING DATE: 1983  
 ENDING DATE: 1988  
 PRESENT STATUS: FY 83 and 84 construction complete  
 PROJECT LIFE (YEARS):

DIS

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983		\$27,963 <sup>2</sup>			\$27,963 <sup>2</sup>		\$27,963 <sup>2</sup>	\$27,963 <sup>2</sup>				
1984		39,109	\$10,000		39,109	\$10,000	49,109	49,109	\$5,000		\$5,000	
1985												
1986												
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL		\$67,072	\$10,000		\$67,072	\$10,000	\$77,072	\$77,072	\$5,000		\$5,000	

<sup>1</sup>Contributed Funds

<sup>2</sup>FY 1983 costs were 1/2 of the total listed for Lolo Cr. and Upper Lochsa Cr. in 1982/83 Annual Report.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%)     

YEARS OCCURRING	BENEFITS	PREDICTED		ACTUAL	
		DISCOUNTED BENEFITS	DISCOUNTED COSTS	DISCOUNTED BENEFITS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====
TOTAL					

DISCOUNTED BENEFITS : DISCOUNTED COSTS     

DISCOUNTED BENEFITS : DISCOUNTED COSTS

## SUMMARY

### 1. Abstract

Based on stream survey data it was concluded that production in Lol10 Creek could be improved by altering the pool-riffle structure and increasing the quality of winter habitat. In FY 1983, (project number 83-522) a total of 145 habitat improvement structures were placed in Lol10 Creek at an average cost of \$186/structure. These structures included: 9 k-dams, 29 log weirs, 16 lateral deflectors, 19 large organic debris jams, 15 cedar root wads, 53 boulder clusters, 3 bark cover devices and 1 pool. A total of 126 of the structures were designed to enhance pool number and quality. The project extended over 8.5 miles of Lol10 Creek.

In FY 1984 (project number 84-6) a total of 258 structures were constructed in Lolo Creek at an average cost per structure of \$152. The FY 1984 efforts were directed towards creation of pocket water and bank cover. The structures used included: 7 k-ds, 4 log weirs, 7 boulder weirs, 4 individual boulder clusters, 5 single boulders, 183 boulder "reaches", 1 boulder deflector, 7 cedar root wads, 7 deflector logs, 8 bank cover devices, and 73 large anchored organic debris. In FY 1984, the project extended over a distance of 11 miles of Lol10 Creek.

A total of 342 structures were installed in 11 stream miles of Lol10 Creek during 1983 and 1984.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

No. FY 1983 work statements, contract agreements and expenditure records were missing from the BPA files.

Annual and evaluation reports were available for 1983, as well as, all documents for 1984.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

Pool/riffle structure, pool quality, and habitat diversity were rated as sub-optimal.

D156

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Ranges were estimated in acres and converted to square yards for this summary. The basis for these estimates was not given in detail.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes. Estimated changes in area of both were given in acres and converted to square yards for this summary .

C. Fish

1. Were the target species clearly identified

Yes. Summer steelhead and spring chinook.

2. Were predictions of change in numbers of each target species based on Quantified changes in habitat

Not clearly. General prediction of increase of 10,001) chinook and 4,000 steelhead smolts, but the basis was not discussed in specific terms.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Adult numbers were not predicted.

4. Was hatchery supplementation discussed

Not in specific terms. It is apparently considered and expected.

D. Economic

1. Were all Project costs included in documents

a. Planning/Design - Not separated.

b. Construction - Yes.

c. Evaluation - Predicted only from project number 83-7.

D157

d Operation & Maintenance - Yes, for FY 1984 only.

e. Other Contributed Funds - None

2. What was the dollar value of the target species based on

No predictions made.

3. Was the time when the benefits would start determined

No. An estimate was given as the end of the 2<sup>nd</sup> fish life cycle.

4. Was the effective life of the project clearly stated

No. Project life was not addressed.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16535  
 PROJECT NUMBER: 84-6  
 PROJECT NAME: Eldorado Creek Fish Passage  
 SUBBASIN NAME: Clearwater River  
 LOCATION: STATE: Idaho  
 TYPE OF PROJECT: INSTREAM \_\_\_\_\_ PASSAGE X PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_  
 RELATED PROJECT NUMBERS: 83-7  
 STREAM(S): Eldorado Creek  
 TARGET SPECIES: spring chinook, summer steelhead  
 COUNTY: Idaho  
 PUBLISHED IN: Natural propagation and habitat improvement. Vol. II: Idaho. Annual and Final Reports 1984 (January 1986). Also: Idaho habitat evaluation for offsite mitigation record. Annual Report 1984.  
 CONTRACTOR: USFS Clearwater National Forest TYPE: FEDERAL X STATE \_\_\_\_\_ TRIBE \_\_\_\_\_ PRIVATE \_\_\_\_\_  
 PROJ. LEADER: Al Espinosa, Jr.  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D159

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	<u>9,670</u>	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	<u>190-240k</u>	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

JUVENILE:	SPECIES	CODE*	NUMBERS
	spring chinook	-----	<u>200,000-245,000</u>

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84BP16535  
 PROJECT NUMBER: 84-6  
 PROJECT NAME: Eldorado Creek Fish Passage  
 SUBBASIN NAME: Clearwater River TARGET SPECIES: spring chinook, summer steelhead  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984		\$17,668	\$5,000		\$17,668	\$5,000	\$22,668	\$22,668				
1985												
1986												
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL		\$17,668	\$5,000		\$17,668	\$5,000	\$22,668	\$22,668				

<sup>1</sup>Contributed Funds

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) _____									
		PREDICTED			ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

## SUMMARY

### 1. Abstract

Four naturally occurring falls and cataracts currently limit access of anadromous fish to 7.5 miles of Eldorado Creek. No chinook are known to use any of the creek but steelhead passage over the barrier may occur with favorable flows. All four barriers are within a 1/4 mile reach located 1/2 mile from the confluence of Eldorado -Creek and Lolo Creek.

It was felt that removal of the barrier would provide access to substantial quantities of spawning and rearing habitat. However, no discussion was provided of the factors currently limiting a cutthroat trout population of 4,440+1,540 fish using the area above the falls.

Sites 1, 2, and 4 were treated according to plan. Site 3, a basalt formation, offered resistance to drilling and blasting. Rock berms were added to provide adequate pool depths at site 3. Blasting at site 4 was the most successful and the 12 ft. falls was reduced to 3 small falls.

### 2. Comments

#### A. Availability of Documents

1. Were all documents available for review

Yes.

#### B. Habitat

1. Were limiting factors discussed in detail

Passage problem, falls and cascades, preventing access for all chinook and most steelhead to spawning and rearing area above. However, no discussion was given on the factors limiting the current resident trout population above the falls.

2. Was the approximate amount of habitat quantified in terms of spawning or rearing habitat

Yes. Spawning **and** rearing area above the barrier was estimated.

D161

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes. Spawning and rearing area above the barrier was estimated in acres.

c. Fish

1. Were the target species clearly identified

Yes. Spring chinook and summer steelhead.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Yes - Made in work statement but not in report.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No conversion to adults done.

4. Was hatchery supplementation discussed

It is apparently anticipated. **No** quantities discussed.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - No.
- b. Construction - Yes.
- c. Evaluation - Yes.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

No predictions made.

3. was the time when the benefits would start determined

No estimate given.

4. Was the effective life of the oroiect clearly stated

No estimate given.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP16121  
 PROJECT NUMBER: 84-31 RELATED PROJECT NUMBERS: 84-5; 84-6  
 PROJECT NAME: Clearwater River Habitat Enhancement STREAM(S): Lolo Creek, Lochsa, and American Rivers  
 SUBBASIN NAME: Clearwater River TARGET SPECIES: summer steelhead (str. B), chinook  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE      PONDS       
                   SIDE CHANNEL      RIPARIAN X  
 PUBLISHED IN: No report specific to this contract or work.  
 CONTRACTOR: USDA For. Ser. Northern Region TYPE: FEDERAL X STATE      TRIBE      PRIVATE       
 PROJ. LEADER: Rick Stowell (Nez Perce N.F.) Al Espinosa (Clearwater N.F.)  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: September 1, 1984  
 COMPLETION DATE: March 31, 1986  
 PRESENT STATUS: Unknown  
 PROJECT LIFE (YEARS): Not given

D164

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT</u> <u>CONDITIONS</u>	<u>POST-PROJ.</u> <u>CONDITIONS</u>	<u>PREDICTED</u> <u>CHANGE</u>	<u>ACTUAL</u> <u>CHANGE</u>	<u>FISH PRODUCED PER</u> <u>UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
JUVENILE:	-----	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-84P16121  
 PROJECT NUMBER: 84-31  
 PROJECT NAME: Clearwater River Habitat Enhancement  
 SUBBASIN NAME: Clearwater River TARGET SPECIES:  
 LOCATION: STATE: Idaho COUNTY: Idaho  
 TYPE OF PROJECT: INSTREAM X PASSAGE     PONDS      
                   SIDE CHANNEL     RIPARIAN X  
 BEGINNING DATE: September 1, 1984  
 ENDING DATE: March 31, 1986  
 PRESENT STATUS: Unknown  
 PROJECT LIFE (YEARS): Not given

D165

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984							\$76,000	\$56,844				
1985												
1986												
OTHER <sup>1</sup>							108,966	108,966				
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL							\$184,966	\$165,810				

<sup>1</sup>Contributed Funds. USFS

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%)    

PREDICTED				ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	DISCOUNTED COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL				TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS    

DISCOUNTED BENEFITS : DISCOUNTED COSTS

SUMMARY

1. Abstract

No project reports for FY 1983 or 1984 were included.

There is a question at this point (12-8-86) if this project number may have been discontinued and the work transferred to another project number 84-6 or 84-5.

2. Comments

A. Availability of Documents

1. Were all documents available for review

No reports of work completed

Financial documents incomplete

B. Habitat

1. Were limiting factors discussed in detail

No. Comments were made concerning mining, logging, and road construction, but details or justification were not provided.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No discussion of habitat quantity.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

C. Fish

1. Were the target species clearly identified

Steelhead, chinook.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No predictions made.

D166

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No predictions made.

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Yes, but not separately.
- b. Construction - Yes, but not separately.
- c. Evaluation - No.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - Yes.

2. What was the dollar value of the target species based on

No predictions made.

3. Was the time when the benefits would start determined

No predictions made.

4. Was the effective life of the project clearly stated

No.

DI67





SUMMARY

1. Abstract

A 9 foot high bedrock falls was suspected of blocking upstream passage of chinook and steelhead. Explosives will be used to create two 4.5 foot drops with suitable jumping pools to allow upstream passage of adults. No work was completed in 1984, but was rescheduled for 1985.

The evaluation study was initiated in 1984 and reported finding equal numbers of steelhead juveniles above and below the falls. No age 0 chinook were found above the falls. Therefore, the barrier was assumed to prevent only upstream passage of adult chinook.

2. Comments

A. Availability of Documents

1. Were all documents available for review

A two page work statement with budget and a two page evaluation study summary were available.

B. Habitat

1. Were limiting factors discussed in detail

Stated as a natural passage barrier.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Not done.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Not done.

C. Fish

1. Were the target species clearly identified

No. Stated that chinook were definitely unable to pass the barrier.

D170

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Not done.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Not done.

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all project costs included in documents

a. Planning/Design - Not separated.

b. Construction - Not separated.

c. Evaluation - Yes.

d. Operation & Maintenance - No.

e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

Not done.

3. Was the time when the benefits would start determined

Not done.

4. Was the effective life of the project clearly stated

Not done.

D171

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP13381  
 PROJECT NUMBER: 83-7  
 PROJECT NAME: South Fork Salmon River Tributary Fish Barrier Removal  
 STREAM(S): Johnson, Six-bit, Two-bit, Curtis, and Dollar Creeks  
 SUBBASIN NAME: Salmon River  
 LOCATION: STATE: Idaho  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN

RELATED PROJECT NUMBERS:  
 TARGET SPECIES:  
 COUNTY: Valley

PUBLISHED IN: Natural propagation and habitat improvement. Vol. II - Idaho. Annual and Final Reports 1984 (January 1986). Also: Idaho habitat evaluation for offsite mitigation record. Annual Report (July 1985).

CONTRACTOR: IDFG TYPE: FEDERAL  STATE  TRIBE  PRIVATE   
 PROJ. LEADER: Herb Pollard/Terry Holubetz  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----

STREAM ORDER:  
 BEGINNING DATE: July 1, 1984  
 COMPLETION DATE: September 30, 1986  
 PRESENT STATUS: Partial completion of 1984 construction.  
 PROJECT LIFE (YEARS):

D172

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED <sup>1</sup> CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	250,000	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	400,000	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	75	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

<sup>1</sup>Although not stated in documents, estimates were assumed to include change from all work for FY 84-86.

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*				
JUVENILE:	-----	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-A179-B4BP13381  
 PROJECT NUMBER: 83-7  
 PROJECT NAME: South Fork Salmon River Tributary Fish Barrier Removal  
 SUBBASIN NAME: Salmon River TARGET SPECIES:  
 LOCATION: STATE: Idaho COUNTY: Valley  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: July 1, 1984  
 ENDING DATE: September 30, 1986  
 PRESENT STATUS: Partial completion of 1984 construction.  
 PROJECT LIFE (YEARS):

D173

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984		\$75,590 <sup>2</sup>	\$7,900				\$83,490					
1985		30,000					30,000					
1986		20,000					20,000					
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL		\$125,590	\$7,900				\$133,490					

<sup>1</sup>Contributed Funds

<sup>2</sup>Probably includes some plan/dgn. funds, but could not be separated as such.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) \_\_\_\_\_

PREDICTED					ACTUAL				
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

DISCOUNTED BENEFITS : DISCOUNTED COSTS \_\_\_\_\_

SUMMARY

1. Abstract

Fish migration barriers have been created by rock and other natural debris in several tributaries to the South Fork Salmon River. The 75 miles of stream located above these barriers contains anadromous fish habitat. Selective removal of debris from barriers on Johnson, Six-bit, Two-bit, Curtis, and Dollar Creeks were proposed for FY 1984. Delay was experienced in the NEPA compliance and work on Dollar and Six-bit Creeks was postponed. Johnson Creek work was only partially completed in 1984 and planned for completion in 1985. No information was given on the status of the work on the remaining creeks.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Documents describing the completion of work done with FY 1984 funds were not available.

B. Habitat

1. Were limiting factors discussed in detail

Natural passage barrier was listed as limiting factor.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes. However, no justification for the estimates was given.

C. Fish

1. Were the target species clearly identified

No. Discussed as "anadromous fish".

D174

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Not done.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No predictions made.

4. Was hatchery supplementation discussed

Stocking with summer chinook was stated as a requirement to establishing runs. No further information was given.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Not separately.
- b. Construction - Not separately.
- c. Evaluation - Yes.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

No estimates of fish value made.

3. Was the time when the benefits would start determined

Not done.

4. Was the effective life of the project clearly stated

Not done.

D175

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP14383  
 PROJECT NUMBER: 83-359  
 PROJECT NAME: Bear Valley Creek Habitat Improvement  
 SUBBASIN NAME: Salmon River  
 LOCATION: STATE: Idaho  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
                   SIDE CHANNEL  RIPARIAN   
 PUBLISHED IN: Natural propagation & habitat improvement. Idaho: Salmon River habitat enhancement  
                   Annual Report 1984. (January 1986).  
 CONTRACTOR: Shoshone-Bannock TYPE: FEDERAL  STATE  TRIBE  PRIVATE   
 PROJ. LEADER: Richard Konopacky  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE: October 1, 1983  
 COMPLETION DATE:  
 PRESENT STATUS: Pre-project evaluation complete and preferred alternative selected  
 PROJECT LIFE (YEARS): 50

D176

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	+1,000%	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*			
JUVENILE:	spring chinook	-----	18,100	-	4,093
SMOLT:	spring chinook	-----	-----	-----	3,400,000
ADULT:	spring chinook	-----	60	-----	8,437 <sup>1</sup>

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS  
<sup>1</sup> Returned females only.

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-B4BP14383  
 PROJECT NUMBER: 83-359  
 PROJECT NAME: Bear Valley Creek Habitat Improvement  
 SUBBASIN NAME: Salmon River TARGET SPECIES: spring chinook  
 LOCATION: STATE: Idaho COUNTY: Valley  
 TYPE OF PROJECT: INSTREAM X PASSAGE     PONDS      
 SIDE CHANNEL X RIPARIAN X  
 BEGINNING DATE: October 1, 1983  
 ENDING DATE:  
 PRESENT STATUS: Pre-project evaluation complete and preferred alternative selected  
 PROJECT LIFE (YEARS): 50

FY	PREDICTED (BUDGET)			INITIAL COSTS			TOTAL		CONTINUING COSTS				
	PLAN/DGN.	CONST.	EVAL.	ACTUAL (INVOICES)			PRED.	ACTUAL	PREDICTED		ACTUAL		
				PLAN/DGN.	CONST.	EVAL.			OPER&MAINT	MONIT.	OPER&MAINT	MONIT.	
1982													
1983													
1984	\$425,987		\$5,000				\$430,987	\$434,577					
1985		\$469,515					469,515	469,515					
1986		991,314					991,314						
OTHER <sup>1</sup>													
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	\$425,987	\$1,460,829	\$5,000				\$1,891,816	\$904,092					

<sup>1</sup>Contributed Funds

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%)    

PREDICTED				ACTUAL					
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS    

DISCOUNTED BENEFITS : DISCOUNTED COSTS    

D177

SUMMARY

1. Abstract

Work completed in FY 1984 included evaluation of existing conditions in the project area of Bear Valley Creek, assessment of limiting factors, alternatives design for improvements and selection of the preferred alternative. The preferred alternative includes construction of a 670 m diversion channel and stabilization of the existing Bear Valley Creek channel. The expected cost was \$2.5 million for project completion.

Pre-project evaluations cost approximately \$200,000 and determined that age 0 + chinook populations would have to change in number 46% before the change could be detected. This was based on the current level of sampling.

Benefits of sediment reduction, all the way from the headwaters of the middle fork of the Salmon River to the mouth of the Columbia, are difficult if not impossible to put a dollar figure on. However, the Corps of Engineers is presently engaged in a project to dredge sediments from the Gorge traffic channel in Lower Granite Reservoir. Some of these sediments came from the dredge area on Bear Valley Creek.

2. Comments

A. Availability of Documents

1. Were all documents available for review

No. Contract agreement for FY 84 was missing from BPA file and justification letter for MOO2 was not available.

B. Habitat

1. Were limiting factors discussed in detail

No. Past dredge mining was identified as degrading spawning habitat and causing excessive sediment loads downstream.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Only a potential percentage increase in the spawning habitat was given.

D178

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No - given as 1,000% increase in spawning habitat.

C. Fish

1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No - based on a percentage increase from a current level of production.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Not done.

4. Was hatchery supplementation discussed

No. Assumed natural rebuilding of the population.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes.
- c. Evaluation - Estimated in project no. 83-7 work statement.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

Not done.

D179

3. Was the time when the benefits would start determined

No. Benefits predictions were not made.

4. Was the effective life of the project clearly stated

Estimated effects of the project to last 50 years.



SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER:  
 PROJECT NUMBER: 83-359  
 PROJECT NAME: East Fork Salmon River  
 SUBBASIN NAME: Salmon River  
 LOCATION: STATE: Idaho  
 TYPE OF PROJECT: INSTREAM \_\_\_\_\_ PASSAGE \_\_\_\_\_ PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_  
 RELATED PROJECT NUMBERS:  
 STREAM(S): East Fork Salmon River  
 TARGET SPECIES:  
 COUNTY:  
 PUBLISHED IN:  
 CONTRACTOR: TYPE: FEDERAL \_\_\_\_\_ STATE \_\_\_\_\_ TRIBE \_\_\_\_\_ PRIVATE \_\_\_\_\_  
 PROJ. LEADER:  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: \_\_\_\_\_  
 STREAM ORDER:  
 BEGINNING DATE:  
 COMPLETION DATE:  
 PRESENT STATUS: Postponed - not implemented prior to FY 1985.  
 PROJECT LIFE (YEARS):

D182

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
JUVENILE:	-----	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-83BP11994  
 PROJECT NUMBER: 83-415 RELATED PROJECT NUMBERS: 83-7  
 PROJECT NAME: Alturas Lake Creek Flow Augmentation STREAM(S): Alturas Lake Creek  
 SUBBASIN NAME: Salmon River TARGET SPECIES: spring chinook, sockeye  
 LOCATION: STATE: Idaho COUNTY: Blaine  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN   
 PUBLISHED IN: Natural propagation and habitat improvement Vol. III - Idaho. Final & Annual Rep. 1982/83 (April 1984).  
 Vol. II - Idaho. Annual & Final Report 1984 (January 1986). Also: Idaho habitat evaluation for offsite  
 mitigation record. Annual Report 1984 (July 1985)  
 CONTRACTOR: US Forest Service - Sawtooth TYPE: FEDERAL  STATE  TRIBE  PRIVATE   
 PROJ. LEADER: Harvey Forsgren  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: April, 1 1983  
 COMPLETION DATE: December 31, 1987  
 PRESENT STATUS: Assessing two alternatives  
 PROJECT LIFE (YEARS): 20

D183

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT</u> <u>CONDITIONS</u>	<u>POST-PROJ.</u> <u>CONDITIONS</u>	<u>PREDICTED</u> <u>CHANGE</u>	<u>ACTUAL</u> <u>CHANGE</u>	<u>FISH PRODUCED PER</u> <u>UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>			
ADULT:	spring chinook	-----	200	-----	850-1,300 <sup>1</sup>
	sockeye	-----	0	-----	4,500
	chinook redds	-----	85	-----	400-600

\* SEE ATTACHED STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

<sup>1</sup> Depending upon alternative selected

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI79-83BP11994  
 PROJECT NUMBER: 83-415  
 PROJECT NAME: Alturas Lake Creek Flow Augmentation  
 SUBBASIN NAME: Salmon River TARGET SPECIES: spring chinook, sockeye  
 LOCATION: STATE: Idaho COUNTY: Blaine  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN   
 BEGINNING DATE: April 1, 1983  
 ENDING DATE: December 31, 1987  
 PRESENT STATUS: Assessing two alternatives  
 PROJECT LIFE (YEARS): 20

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983	\$39,000			\$38,115			\$39,000	\$38,115				
1984			\$5,000			\$5,000	5,000	5,000				
1985		\$294-320k <sup>2</sup>					294-320k <sup>2</sup>					
1986			16,700	9,027			16,700	9,027				
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL	\$39,000	\$293-320k	\$21,700	\$47,142		\$5,000	\$354-381k	\$52,142				

<sup>1</sup>Contributed Funds  
<sup>2</sup>Depending upon alternative selected.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%)		PREDICTED				ACTUAL			
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
0			\$375,600	\$375,600 <sup>3</sup>					
1-20		\$7,337,000 <sup>3</sup>							
0			349,400	349,400 <sup>4</sup>					
1-20		6,461,500 <sup>4</sup>							
=====		=====		=====	=====		=====		=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS  $\frac{20:1^3}{18.5:1^4}$

<sup>3</sup>Using flow augmentation option and average of 4 possible flow regimes  
<sup>4</sup>Using water rights purchase option

D184

SUMMARY

1. Abstract

Irrigation diversion has caused complete dewatering of a section of Alturas Lake Creek and has eliminated a population of sockeye salmon (4,500 spawners) and believed to be limiting the population of spring chinook salmon (historically averaged 1,300 spawners now averages 350 spawners). The USFS was evaluating two alternatives to alleviate the problem: 1) raise the elevation of Alturas Lake to store water for release during period of diversion (cost - \$375,600); 2) purchase the diversion water rights and eliminate the diversion (cost - \$349,400). Neither option was selected as of FY 1985. A fish hatchery (Sawtooth) has been capturing adults downstream of the diversion for use in the hatchery and limiting the number passing upstream. Fish would have to be stocked in the creek after project construction.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

B. Habitat

1. Were limiting factors discussed in detail

Stated as low instream flow resulting from irrigation diversion and loss of smolts through diversion.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Habitat quantity was referred to in making fish estimates, but no methods nor estimates were given.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. (See 2.B.2 above)

D185

C. Fish1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No. (See 2.B.2 above)

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No - used number of spawners only - did not predict smolt numbers.

4. Was hatchery supplementation discussed

Yes. Stocking has begun, but details and costs were not provided. Benefits predictions assume hatchery outplants will occur in year 1.

D. Economic1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes.
- c. Evaluation - Yes.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

Meyer, 1982. \$550 per chinook spawner and \$18 per sockeye spawner.

3. Was the time when the benefits would start determined

No. Assumed a gradual build-up of benefits over years 1 - 5 with full benefits occurring in Year 5.

4. Was the effective life of the project clearly stated

No - used 20 years for benefits discounting.

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D187



SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-A179-83BP11991  
 PROJECT NUMBER: 83-416  
 PROJECT NAME: Pole Creek Irrigation Diversion Screening  
 SUBBASIN NAME: Salmon River TARGET SPECIES: spring chinook, summer steelhead  
 LOCATION: STATE: Idaho COUNTY: Blaine  
 TYPE OF PROJECT: INSTREAM \_\_\_ PASSAGE X PONDS \_\_\_  
 SIDE CHANNEL \_\_\_ RIPARIAN \_\_\_  
 BEGINNING DATE: February 1, 1983  
 ENDING DATE: September 30, 1986  
 PRESENT STATUS: Screen installed & operating  
 PROJECT LIFE (YEARS): 20

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983							\$29,725 <sup>2</sup>	\$29,025 <sup>2</sup>				
1984			\$2,500				2,500					
1985												
1986												
OTHER <sup>1</sup>												
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL			\$2,500				\$30,225	\$29,025				

<sup>1</sup>Contributed Funds

<sup>2</sup>Sufficient information was not available to separate predicted or actual costs into plan/dgn., const., or evaluation.

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 4

YEARS		PREDICTED			ACTUAL				
OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
0	\$0	\$0	\$29,725	\$29,725					
1	35,902	34,520							
2	71,804	66,387							
3	107,515	95,580							
4	133,915	114,471							
5-20	179,319	1,786,100							
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL		\$2,100,000		\$29,725	TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS 70.5:1

DISCOUNTED BENEFITS : DISCOUNTED COSTS

## SUMMARY

### 1. Abstract

BPA funds were used in FY 1983 to place a rotary screen at the inlet to the irrigation system to prevent spring chinook and summer steelhead juveniles and smolts from entering. During 1982 the system was converted from flood to sprinkler irrigation. The funding or responsibility for this 1982 work was not evident in the available documents. Under the flood irrigation system, water was diverted at seven locations (total of 65.6 cfs) leaving the stream channel dewatered below the lowermost diversion. Chinook salmon were prevented from entering and spawning in Pole Creek upstream from the diversions. Under the new overhead sprinkler method of irrigation, only 12-18 cfs of water is withdrawn and only at one point which simplifies screening. The difference in diverted flow (47.6-53.6 CFS) is left in the stream channel to allow fish passage, spawning and rearing. The benefits achieved from the BPA work are dependent upon this increased instream flow.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

Yes.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

Yes - Mortality of migrating smolts diverted by the irrigation system.

##### 2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No. Habitat surveys were cited, but no figures were given except as total area accessible (7.5 acres).

DI90

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No. Total predicted fish above the old barrier was based on habitat quantities, but the methods were not presented. Benefits were 25% (increase in survival due to screening) of the predicted potential.

C. Fish

1. Were the target species clearly identified

Yes. Summer steelhead and chinook salmon.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Based on access to upstream habitat and protection from smolts being diverted into the irrigation canal. However, basis for estimates was not presented.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No. Estimates based on number of spawners per acre of habitat.

4. Was hatchery supplementation discussed

Mentioned in work statements, but not discussed in terms of costs or benefits.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - No.
- b. Construction - Yes.
- c. Evaluation - No.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - None

D191

2. What was the dollar value of the target species based on

Meyer 1982.

\$550 per spawning chinook, \$359 per spawning steelhead.

3. Was the time when the benefits would start determined

No. Benefits started in year 1 and were increased gradually with full benefits occurring in year 5.

4. Was the effective life of the project clearly stated

No, used 20 years for B/C calculations.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP64321  
 PROJECT NUMBER: 84-23  
 PROJECT NAME: Camas Creek  
 SUBBASIN NAME: Salmon River  
 LOCATION: STATE: Idaho  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN

RELATED PROJECT NUMBERS:  
 STREAM(S): Camas Creek  
 TARGET SPECIES: summer steelhead, spring chinook  
 COUNTY: Lemhi

PUBLISHED IN: Idaho habitat evaluation for offsite mitigation record. Annual Report (July 1984).  
 CONTRACTOR: USFS - Salmon N.F. TYPE: FEDERAL  STATE  TRIBE  PRIVATE   
 PROJ. LEADER: Bruce May  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: 1983  
 COMPLETION DATE: 1990  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

D193

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*				
SMOLT:	summer steelhead	-----	-----	-----	4,586	-----
	spring chinook	-----	-----	-----	24,570	-----
ADULT:	summer steelhead	-----	-----	-----	76	-----
	spring chinook	-----	-----	-----	128	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS

SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-AI-79-84BP64321  
 PROJECT NUMBER: 83-23  
 PROJECT NAME: Camas Creek  
 SUBBASIN NAME: Salmon River · TARGET SPECIES: summer steelhead, spring chinook  
 LOCATION: STATE: Idaho COUNTY: Lemhi  
 TYPE OF PROJECT: INSTREAM X PASSAGE     PONDS      
 SIDE CHANNEL     RIPARIAN X  
 BEGINNING DATE: 1983  
 ENDING DATE: 1990  
 PRESENT STATUS:  
 PROJECT LIFE (YEARS):

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983	\$4,669						\$4,669					
1984												
1985												
1986												
OTHER <sup>1</sup>												
TOTAL												

D194

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) <u>   </u>									
		PREDICTED					ACTUAL		
YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS	YEARS OCCURRING	BENEFITS	DISCOUNTED BENEFITS	COSTS	DISCOUNTED COSTS
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
=====	-----	=====	-----	=====	=====	-----	=====	-----	=====
TOTAL					TOTAL				

DISCOUNTED BENEFITS : DISCOUNTED COSTS    

DISCOUNTED BENEFITS : DISCOUNTED COSTS    

<sup>1</sup>Contributed Funds

SUMMARY

1. Abstract

Apparently, no work beyond feasibility and planning have been completed prior to 1985. No further information is available. An evaluation study was begun in 1983 and continued in 1984 by IDFG. No budgets or expenditures for this portion were available. No justification, explanation or support of the predicted benefits were given in the proposals/work statements.

The proposed work was re-vegetation and stabilization of the riparian zone and streambanks, and placement of instream structures.

2. Comments

A. Availability of Documents

1. Were all documents available for review

No. Report of work completed, contract agreement and expenditures records were not available.

B. Habitat

1. Were limiting factors discussed in detail

No discussion of limiting factors.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No quantification of habitat.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

C. Fish

1. Were the target species clearly identified

No. Discussions included chinook and steelhead.

D195

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No basis was given for prediction of anadromous fish benefits.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No done.

4. Was hatchery supplementation discussed

No.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - No.
- c. Evaluation - No.
- d. Operation & Maintenance - No.
- e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

No dollar benefits prediction made.

3. Was the time when the benefits would start determined

Not estimated.

4. Was the effective life of the project clearly stated

Not estimated.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AI79-84BP17579  
 PROJECT NUMBER: 84-24 RELATED PROJECT NUMBERS: 83-359; 83-7  
 PROJECT NAME: Habitat Enhancement for Middle Fork & Upper Salmon River  
 STREAM(S): Bear Valley, Marsh & Elk Creeks  
 SUBBASIN NAME: Salmon River TARGET SPECIES: summer steelhead, spring chinook  
 LOCATION: STATE: Idaho COUNTY: Valley  
 TYPE OF PROJECT: INSTREAM X PASSAGE X PONDS \_\_\_\_\_  
 SIDE CHANNEL \_\_\_\_\_ RIPARIAN \_\_\_\_\_

PUBLISHED IN: Idaho evaluation for offsite mitigation. Annual Report 1984. (July 1985).

CONTRACTOR: USFS TYPE: FEDERAL X STATE \_\_\_\_\_ TRIBE \_\_\_\_\_ PRIVATE \_\_\_\_\_

PROJ. LEADER: Don Duff

SUBBASIN NUMBER:

EPA STREAM SEG./MILE CODE: \_\_\_\_\_

STREAM ORDER:

BEGINNING DATE: May 1, 1984

COMPLETION DATE: 1988

PRESENT STATUS: Phase I complete

PROJECT LIFE (YEARS):

D197

<u>HABITAT DESCRIPTION</u>	<u>PRE-PROJECT CONDITIONS</u>	<u>POST-PROJ. CONDITIONS</u>	<u>PREDICTED CHANGE</u>	<u>ACTUAL CHANGE</u>	<u>FISH PRODUCED PER UNIT OF HABITAT</u>	
					<u>PREDICTED</u>	<u>ACTUAL</u>
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ.YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	<u>SPECIES</u>	<u>CODE*</u>				
JUVENILE:	-----	-----	-----	-----	-----	-----
SMOLT:	-----	-----	-----	-----	-----	-----
ADULT:	-----	-----	-----	-----	-----	-----

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS



SUMMARY

1. Abstract

The FY 1984 budget was for habitat inventories and assessment and development of habitat improvement alternatives with costing and benefits predictions. A report of the 1984 work was submitted to BPA, but not accepted. Preliminary evaluation was done under Project 83-7 by IDFG and Shoshone-Bannock Tribe.

Complete analysis cannot be made until a report covering FY 1984 is available. The individual evaluation reports (Project 83-7) do not contain predicted nor actual costs, nor habitat assessments.

2. Comments

A. Availability of Documents

1. Were all documents available for review

No. Work statements and cost summaries were the only documents available under this project (84-24). Preliminary population and habitat data were reported in the Evaluation Project 83-7.

B. Habitat

1. Were limiting factors discussed in detail

No. Habitat problems were identified generically as impacts associated with live stock grazing, timber harvest, mining, water withdrawals, and passage blocks.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

No report on this project number.

Project 83-7 identified sample segments in terms of length in yards, width in yards, and area in square yards, but did not differentiate as spawning or rearing.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

No.

D  
199

C. Fish1. Were the target species clearly identified

No. Anadromous Steelhead and Chinook primarily.

Project 83-7 records data for sample sections for resident species also.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

No predictions made.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

No predictions made.

4. Was hatchery supplementation discussed

No.

D. Economic1. Were all project costs included in documents

a. Planning/Design - Predicted costs in work statement.

b. Construction - Not covered in this FY.

c. Evaluation - Somewhat generally in Project 83-7

d. Operation & Maintenance - No.

e. Other Contributed Funds - No.

2. What was the dollar value of the target species based on

Not considered in available reports.

3. Was the time when the benefits would start determined

Not considered in available reports.

4. Was the effective life of the project clearly stated

No, neither clearly nor otherwise.

PAGE 5 F: 84-24

D201



SUMMARY OF HABITAT IMPROVEMENT PROJECT COSTS

CONTRACT NUMBER: DE-A179-84BP17447  
 PROJECT NUMBER: 84-28  
 PROJECT NAME: Lemhi River Habitat Improvement and Study  
 SUBBASIN NAME: Salmon River TARGET SPECIES: summer steelhead, spring chinook  
 LOCATION: STATE: Oregon COUNTY: Lemhi  
 TYPE OF PROJECT: INSTREAM     PASSAGE X PONDS      
 SIDE CHANNEL     RIPARIAN      
 BEGINNING DATE:  
 ENDING DATE:  
 PRESENT STATUS: Alternatives Formulated & Analyzed  
 PROJECT LIFE (YEARS): 50

FY	INITIAL COSTS						CONTINUING COSTS					
	PREDICTED (BUDGET)			ACTUAL (INVOICES)			TOTAL		PREDICTED		ACTUAL	
	PLAN/DGN.	CONST.	EVAL.	PLAN/DGN.	CONST.	EVAL.	PRED.	ACTUAL	OPER&MAINT	MONIT.	OPER&MAINT	MONIT.
1982												
1983												
1984	\$170,716				\$168,716							
1985		1.4 to 4.6mil										
1986												
OTHER <sup>1</sup>												
TOTAL	\$170,716	\$1.4 to 4.6mil		\$168,716							\$11,300/yr.	

<sup>1</sup>Contributed Funds

DISCOUNTED BENEFITS TO COSTS RATIO CALCULATION.

DISCOUNT RATE (%) 3

YEARS OCCURRING	BENEFITS	PREDICTED		YEARS OCCURRING	BENEFITS	ACTUAL	
		DISCOUNTED BENEFITS	DISCOUNTED COSTS			DISCOUNTED BENEFITS	DISCOUNTED COSTS
0			\$1,734,000	0			\$1,734,000
1-50			11,300	1-50	\$30,670	\$648,800	290,700
TOTAL		\$648,800	\$2,025,000	TOTAL			

DISCOUNTED BENEFITS : DISCOUNTED COSTS 0.32:1<sup>2</sup>

DISCOUNTED BENEFITS : DISCOUNTED COSTS    

<sup>2</sup>Ratios were calculated for 16 alternatives and ranged from 0.003 to 0.32.

D203

SUMMARY

1. Abstract

This project is attempting to alleviate upstream passage problems caused by low flows resulting from water diversion for flood irrigation. The major alternative is to alter the channel structure in critical locations and alter the irrigation methods to reduce the quantity of water diverted from the channel.

The only phase of this project which has been completed through FY 1984 was planning and design. Several alternative solutions were described in detail and the benefits and costs predicted.

2. Comments

A. Availability of Documents

1. Were all documents available for review

Yes.

B. Habitat

1. Were limiting factors discussed in detail

Yes. A passage problem caused by dams and low stream flows resulting from irrigation withdrawals.

2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Rearing habitat was quantified in six categories. Spawning habitat was not considered limiting and was not quantified.

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes, for rearing habitat only.

C. Fish

1. Were the target species clearly identified

Yes.

D204

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Yes. Other variables include: ranges in downstream and upstream passage and hatchery supplementation regimes.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Yes. Smolt to adult survival rates:  
 steelhead 1.39-5.19%  
 chinook 1.05-1.5 %

4. Was hatchery supplementation discussed

Yes. Three of the management alternatives required maintenance of the current level of hatchery supplementation (2,000 spawners per year) and natural building of the run size. The fourth alternative called for full hatchery supplementation to fully seed the habitat during the first life cycle and then releasing only the 2,000 spawners per year after that point.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes.
- c. Evaluation - No.
- d. Operation & Maintenance - Yes.
- e. Other Contributed Funds - None

2. What was the dollar value of the target species based on

The authors reviewed several methods and selected:

Spring chinook total harvest - \$89.36 per fish;  
 sport = \$125/fish at 57%, commercial = \$42.12/fish  
 at 43%

Summer steelhead total harvest - \$65.43 per fish;  
sport = \$75/fish at 82%, commercial = \$21.81/fish  
at 18%

3. Was the time when the benefits would start determined

Yes. Depending on the alternative benefits begin in years 3 to 31. The estimates depended on the hatchery supplementation level, harvest levels allowed and delay expected before the habitat reached its full production level.

4. Was the effective life of the project clearly stated

No. Stated as 50 years for benefit and cost discounting.

SUMMARY OF HABITAT IMPROVEMENT PROJECT WORK AND BENEFITS.

CONTRACT NUMBER: DE-AC79-84BP17449  
 PROJECT NUMBER: 84-29 RELATED PROJECT NUMBERS: 83-7  
 PROJECT NAME: Panther Creek, Idaho Habitat Rehabilitation STREAM(S): Panther Creek  
 SUBBASIN NAME: Salmon River TARGET SPECIES: spring chinook, summer steelhead  
 LOCATION: STATE: Idaho COUNTY: Lemhi  
 TYPE OF PROJECT: INSTREAM  PASSAGE  PONDS   
 SIDE CHANNEL  RIPARIAN   
 PUBLISHED IN: Habitat rehabilitation - Panther Creek, Idaho, Final Report 1985  
 (January 1986). Also: Idaho habitat evaluation for offsite mitigation record.  
 Annual Report 1984 (July 1985).  
 CONTRACTOR: Bechtel Group TYPE: FEDERAL  STATE  TRIBE  PRIVATE   
 PROJ. LEADER: Dudley Reiser  
 SUBBASIN NUMBER:  
 EPA STREAM SEG./MILE CODE: -----  
 STREAM ORDER:  
 BEGINNING DATE: September, 1984  
 COMPLETION DATE:  
 PRESENT STATUS: Alternative scoping completed  
 PROJECT LIFE (YEARS): 50

D207

HABITAT DESCRIPTION	PRE-PROJECT CONDITIONS	POST-PROJ. CONDITIONS	PREDICTED CHANGE	ACTUAL CHANGE	FISH PRODUCED PER UNIT OF HABITAT	
					PREDICTED	ACTUAL
SPAWNING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
REARING AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
TOTAL USABLE AREA (SQ. YD.)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
POOL/RIFFLE RATIO	-----	-----	-----	-----	-----	-----
PONDS (NO. & TOTAL ACREAGE)	-----	-----	-----	-----	-----	-----
SIDE CHANNELS (SQ. YD.)	-----	-----	-----	-----	-----	-----
RIPARIAN	-----	-----	-----	-----	-----	-----
AREA (ACRES)	-----	-----	-----	-----	-----	-----
STREAM LENGTH (MILES)	-----	-----	-----	-----	-----	-----
DOWNSTREAM IMPACT (MILES)	-----	-----	-----	-----	-----	-----
WATER TEMP. (DEG. C.)	-----	-----	-----	-----	-----	-----
SEDIMENT	-----	-----	-----	-----	-----	-----

FISH PRODUCTION (NUMBERS)

	SPECIES	CODE*		MEDIAN
SMOLT:	Steelhead	-----		105,178
	Chinook	-----	36,609-173,746 <sup>1</sup>	531,309
ADULT:	Steelhead	-----	366-1,737	1,051
	Chinook	-----	1,077-4,235	2,657

\* USE CODE IN REPORT ON STOCK ASSESSMENT OF COLUMBIA RIVER ANADROMOUS SALMONIDS  
<sup>1</sup> Depending upon alternative selected.



## SUMMARY

### 1. Abstract

This project consists of planning and study to consider four alternatives to clean up toxic wastes from mine shafts and waste piles in the Panther Creek drainage. Panther Creek drainage contains the largest known reserve of cobalt (a strategic metal) in North America. Mining began in the drainage in the 1890's. The greatest mining activity occurred in the early to mid-1950's as a result of the Department of Defense subsidies for obtaining strategic metals. Over 200 adult chinook, steelhead and resident salmonids were found dead in Panther Creek in 1954. No chinook redds were counted in Panther Creek during the late 50's and 60's. Two tributaries, Blacktail and Bucktail creeks are the two major pathways for toxic wastes to enter Panther Creek. Live car tests conducted by the Idaho Department of Fish and Game suggests that the toxicity levels are subsiding in Panther Creek, although the section below Deer Creek is still highly toxic. Adult steelhead have been planted in Panther Creek since 1982 and the first adult returns were expected in 1986-87.

### 2. Comments

#### A. Availability of Documents

##### 1. Were all documents available for review

Yes.

#### B. Habitat

##### 1. Were limiting factors discussed in detail

Yes. Water quality parameters were measured in detail and show levels limiting to aquatic life. Also, habitat quantified in IFIM study shows limiting types.

##### 2. Was the pre-project amount of habitat quantified in terms of spawning or rearing habitat

Yes, using IFIM.

D209

3. Were predicted changes in habitat quantified in terms of spawning or rearing habitat so that estimates of fish can be made

Yes - used weighted usable area from IFIM, space requirements of redds and juveniles, and documented survival rates.

C. Fish

1. Were the target species clearly identified

Yes.

2. Were predictions of change in numbers of each target species based on quantified changes in habitat

Yes - using IFIM weighted usable areas.

3. If the predicted change in numbers of fish was based on adults, were the survival rates clearly stated for conversion from smolt or juvenile to adult

Yes - used 0.5% and 1.0% smolt to adult survival rates for chinook and steelhead, respectively.

4. Was hatchery supplementation discussed

Yes, but status of incorporation as a cost could not be determined from the report.

D. Economic

1. Were all project costs included in documents

- a. Planning/Design - Yes.
- b. Construction - Yes.
- c. Evaluation - Estimated from project no. 83-7 work statement.
- d. Operation & Maintenance - Yes.
- e. Other Contributed Funds - None.

2. What was the dollar value of the target species based on

Army Corps of Engineers (1985) and Theurer, et.al. (1985).

steelhead = \$106.43/spawner  
chinook = \$137.24/spawner

3. Was the time when the benefits would start determined

No - used year 0 and year 5 for benefits discounting.

4. Was the effective life of the project clearly stated

No - used a perpetuity for benefits discounting and 50 years for operation and maintenance cost discounting.

APPENDIX E

Appendix Table E-1. Predicted Habitat, Fish Benefits, Value of Benefits, Costs, and Discounted Benefit to Cost Ratios with Variables Used for Each Project for Oregon and Washington. Data based on reports for fiscal years 1982, 1983, and 1984.

PROJECT NAME	HABITAT CHANGE (SQ. YD.)		SPECIES*	NUMBER	TOTAL	% SURV.	TOTAL	CATCH:	ADULT CHANGE (NO.)		
	REARING	SPAWNING		SMOLTS PER HAB.	SMOLT CHANGE (NO.)		SMOLT TO ADULT		CHANGE (NO.)	ESCAPE. RATIO	ESCAPE.
<b>OREGON</b>											
Mt. Hood											
84-11 :Upper Lake Branch :Fish/Wash Cr.	5,100	400	steelhead		1,000						
			coho		6,800						
83-341:West Fork Hood R. Deschutes River	406,750		steelhead		29,000	8	2,352	1:1		1,176	
81S-8 :Warm Springs :Beaver Cr.			chinook		6,775					169 <sup>1</sup>	
83-423:Trout Cr.			steelhead							1,300	
83-450:White R. John Day River	300,000	18,000									
84-8 :N.F. John Day R.			chinook		7,260	0.625				45	
:Clear & Granite Cr.		4,875 <sup>2</sup>	chinook		27,890	1;0.625 <sup>3</sup>				249	
82-9 :Deer Cr.		1,140	steelhead		1,357	3.2	43	30:70		30	13
:Camp Cr.	4,165	0	steelhead		10,240	4	410	60:40		164	202
84-21 :John Day R.			steelhead		220,000						44
			chinook		625,000						
84-22 :E.F. Beech/Canyon Cr	9,472		steelhead		7,750	2	155	2:1		51	
83-384:Murderers & Deer Cr			steelhead		7,760	2	155	2:1		51	
83-473:Cottonwood Cr. Umatilla River	390 <sup>1</sup>	1,415 <sup>1</sup>	steelhead		2,200	3	66	2:1		22	
84-10 :Comprehensive Plan			steelhead							2,236 <sup>1</sup>	
			fall chin.							8,562 <sup>1</sup>	
			chinook							1,532 <sup>1</sup>	
83-434:Lower Umatilla R.										0	
83-834:Lower Umatilla R.										0	
83-436:Umatilla R. 3mi Dam Grande Ronde										0	
84-9 :Elk (USFS land) & Sheep Cr.			chinook		5,905						
84-25 :Elk Cr. (ODFW Contr.)			steelhead		1,593						
83-392:Peavine Cr.			steelhead							525	
			steelhead							102	153
<b>WASHINGTON</b>											
83-477:Enloe Dam	1,520,000	1,150,000	steelhead		610,000	1.5-4.0		23:77 <sup>1</sup>		16,850 <sup>1</sup>	4,000 <sup>1</sup>
:Similkameen R.			chinook		3,200,000 <sup>1</sup>						1,000
83-446:Tumwater Falls			chinook							150 <sup>1</sup>	
			fall chin.							41 <sup>1</sup>	
			steelhead							300	
:Dryden Dam			chinook							182 <sup>1</sup>	
			fall chin.							450 <sup>1</sup>	
			steelhead							300	

<sup>1</sup>Average of range of estimates resulting from several alternatives or variables.

<sup>2</sup>From FY 1982 work only. Habitat changes also occurred from FY 1983 and 1984 work, but were not estimated by contractor.

<sup>3</sup>1% Survival rate for FY 1982 and 1983 work and 0.625% for FY 1984 work.

\*Spring chinook and summer steelhead unless otherwise noted.

<sup>4</sup>Adult change for these projects listed under 84-10.

Appendix Table E-1. (cont.)

PROJECT NAME	PREDICTED COSTS				PRESENT VALUE TOTAL COSTS	PRESENT VALUE BENEFIT: COST RATIO
	PLAN/DGN & CONSTRUCTION	OPERAT. & MAINT PER YEAR	YRS	TOTAL EVAL.		
<b>OREGON</b>						
<b>Mt. Hood</b>						
84-11 :Upper Lake Branch	\$34,844			\$1,500	\$46,340	
:Fish/Wash Cr.	\$80,720			\$77,000	\$157,720	
83-341:West Fork Hood R.	\$400,127				\$400,127	\$385,320 7.4:1
<b>Deschutes River</b>						
81S-8 :Warm Springs					\$415,484	
:Beaver Cr.	\$79,355				\$79,355	
83-423:Trout Cr.	\$286,783				\$286,783	
83-450:White R.	\$326,532				\$3,526,532 <sup>1</sup>	\$4,600,000 <sup>2</sup>
<b>John Day River</b>						
84-8 :N.F. John Day R.					\$46,600 <sup>2</sup>	\$46,600 <sup>2</sup> 7.2:1 <sup>2</sup>
:Clear & Granite Cr.	\$175,928	\$3,000	20	\$44,109	\$280,067	\$250,119 7.3:1
82-9 :Deer Cr.	\$22,760	\$800	20	\$44,109	\$66,869	\$32,232 <sup>3</sup> 4.2:1
:Camp Cr.	\$181,650	\$3,000	20	\$44,109	\$285,759	\$213,430 <sup>3</sup> 1.1:1
84-21 :John Day R.	\$1,106,494				\$1,106,494	
84-22 :E.F.Beech/Canyon Cr	\$91,227 <sup>2</sup>				\$91,227 <sup>2</sup>	\$91,227 <sup>2</sup> 2.7:1 <sup>2</sup>
83-384:Murderers & Deer Cr	\$65,010 <sup>2</sup>				\$65,010 <sup>2</sup>	\$65,010 <sup>2</sup> 3.8:1 <sup>2</sup>
83-473:Cottonwood Cr.	\$22,108				\$22,108	\$22,108 4.7:1
<b>Umatilla River</b>						
84-10 :Comprehensive Plan	\$89,500,000 <sup>1</sup>				\$89,500,000 <sup>1</sup>	
83-434:Lower Umatilla R.					\$441,041	
83-834:Lower Umatilla R.					\$170,746	
83-436:Umatilla R. 3mi Dam					\$5,750,000 <sup>1</sup>	
<b>Grande Ronde</b>						
84-9 :Elk (USFS land) & Sheep Cr.					\$40,402	
84-25 :Elk Cr. (ODFW Contr.)					\$259,231	
83-392:Peavine Cr.	\$104,700 <sup>4</sup>	\$1,000	59		\$163,700	\$105,786 2.7:1
<b>WASHINGTON</b>						
83-477:Enloe Dam						\$9,917,000 <sup>1</sup> 0.9:1 <sup>1</sup>
:Similkameen R.						
83-446:Tumwater Falls					\$997,738	\$997,738
:Dryden Dam					\$1,009,838	\$1,009,838

<sup>1</sup>Average of range of estimates resulting from several alternatives or variables.

<sup>2</sup>Used actual, not predicted, costs and predicted benefits for benefit to cost ratio.

<sup>3</sup>Evaluation costs were incurred, but not included in present value of total costs.

<sup>4</sup>Includes replacement costs.

<sup>5</sup>Refer to notes 1 & 4.

Appendix Table E-1. (cont.)

PREDICTED BENEFITS

PROJECT NAME	VALUE PER ADULT			TOTAL	YEARS OCCURRING	DISCOUNT RATE (%)	PRESENT VALUE TOTAL BENEFITS
	ESCAPE.	SPORT	COMM.	YEARLY BENEFITS			
<b>OREGON</b>							
<b>Mt. Hood</b>							
84-11 :Upper Lake Branch :Fish/Wash Cr.							
83-341:West Fork Hood R. Deschutes River	\$179			\$210,500	1-20	4	\$2,860,700
81S-8 :Warm Springs :Beaver Cr.							
83-423:Trout Cr.				\$500,000			
83-450:White R. John Day River							
84-8 :N.F. John Day R. :Clear & Granite Cr.	\$550			\$24,750	1-20	4	\$336,360
82-9 :Deer Cr. :Camp Cr.	\$359	\$214		\$13,552	2-20	4	\$130,845
84-21 :John Day R.		\$57 <sup>2</sup>	\$22	\$35,000	1-20	4	\$225,885
84-22 :E.F. Beech/Canyon Cr	\$359			\$18,309	5-30	4	\$250,140
83-384:Murderers & Deer Cr	\$359			\$18,309	5-30	4	\$250,140
83-473:Cottonwood Cr. Umatilla River	\$359			\$7,634	1-20	4	\$103,750
84-10 :Comprehensive Plan							
83-434:Lower Umatilla R.							
83-834:Lower Umatilla R.							
83-436:Umatilla R. 3mi Dam Grande Ronde							
84-9 :Elk (USFS land) & Sheep Cr.							
84-25 :Elk Cr. (ODFW Contr.)							
83-392:Peav : Cr.		\$31 <sup>3</sup>		\$20,000	10-60	4	\$290,252
<b>WASHINGTON</b>							
83-477:Enloe Dam :Similkameen R.		\$144	\$22		1-50	3	\$9,165,225 <sup>1</sup>
83-446:Tumwater Falls	\$500			\$145,000			
	\$500						
	\$270						
:Dryden Dam	\$500			\$400,500			
	\$500						
	\$270						

<sup>1</sup>Average of range of estimates resulting from several alternatives or variables.

<sup>2</sup>Value per recreational visitor day.

<sup>3</sup>Value per fishing day.

Appendix Table E-2. Predicted Habitat, Fish Benefits, Value of Benefits, Costs, and Discounted Benefit to Cost Ratios with Variables Used for each Project for Idaho. Data based on reports for fiscal years 1982, 1983, and 1984.

PROJECT NAME	HABITAT CHANGE (SQ. YD.)		SPECIES <sup>3</sup>	NUMBER	TOTAL	% SURV. SMOLT TO ADULT	TOTAL	CATCH: ESCAPE. RATIO	ADULT CHANGE (NO.)		
	REARING	SPAWNING		SMOLTS PER HAB. UNIT	SMOLT CHANGE (NO.)		ADULT CHANGE (NO.)		ESCAPE.	SPORT	COMM.
<b>IDAHO</b>											
Clearwater River											
84-5 :Red River			steelhead		33,180	1.6			464		
			chinook		33,700	1.2			530		
:Crooked R.		4,533	steelhead		8,729	1.6			139		
			chinook		9,366	1.2			112		
82-1 :Clear, Orofino & Potlach Cr.											
84-6 :Lolo Cr. (83-522)	240,000	58,000	steelhead		10,000						
			chinook		4,000						
:Eldorado Cr.	215,000 <sup>1</sup>	9,670	chinook		222,000 <sup>2</sup>						
:Upper Crooked Fk. & White Sand (83-522)	377,000	4,495	steelhead		27,150						
			chinook		27,000						
84-31 :S.F. Clearwater Cr. Salmon River											
83-7 :Boulder Cr.											
:South Fork Salmon R.	400,000	250,000	steelhead						141		
83-416:Pole Cr.			chinook						234		
83-23 :Camas Cr.			steelhead		4,586	1.66			76		
			chinook		24,570	0.52			128		
83-359: Bear Valley Cr. (Sho-Ban Contract)		1000%	chinook		3,400,000				8,437 <sup>4</sup>		
83-415: Alturas Lake Cr.			chinook						1,075 <sup>1</sup>		
			sockeye						4,500		
84-24 :Bear Valley (USFS), Elk & Marsh Cr.											
84-28 :Lemhi R.	32,199		steelhead			1.4-5.2				10 - 176	0-133
			chinook			1.1-1.5				-21to35	-5to8
84-29 :Panther Cr.			steelhead		105,178	1			1,051		
			chinook		531,309	0.5			2,657		

<sup>1</sup>Average of range of estimates from several alternatives or variables.

<sup>2</sup>Juveniles only, not smolts.

<sup>3</sup>Spring chinook and summer steelhead unless otherwise noted.

<sup>4</sup>Females only.

Appendix Table E-2. (cont.)

PROJECT NAME	PREDICTED COSTS				TOTAL COSTS	PRESENT VALUE TOTAL COSTS	PRESENT VALUE BENEFIT: COST RATIO
	PLAN/DGN & CONSTRUCTION	OPERAT. & MAINT PER YEAR	YRS	TOTAL EVAL.			
<b>IDAHO</b>							
<b>Clearwater River</b>							
84-5 :Red River	\$201,397			\$5,000	\$206,397	\$725,461 <sup>2</sup>	15.0:1
:Crooked R.	\$124,500			\$10,000	\$134,500	\$361,082 <sup>2</sup>	6.2:1
82-1 :Clear, Orofino & Potlach Cr.							
84-6 :Lolo Cr. (83-522)	\$66,109	\$5,000	1	\$10,000	\$76,109		
:Eldorado Cr.	\$17,668			\$5,000	\$22,668		
:Upper Crooked Fk. & White Sand (83-522)	\$49,970	\$15,000	1	\$12,500	\$62,470		
84-31 :S.F. Clearwater Cr. Salmon River	\$184,966				\$184,966		
83-7 :Boulder Cr.	\$29,113			\$12,500	\$41,613		
:South Fork Salmon R.	\$125,510			\$7,900	\$133,490		
83-416:Pole Cr.	\$29,725			\$2,500	\$30,225	\$29,725	70.5:1
83-23 :Camas Cr.	\$4,669				\$4,669		
83-359: Bear Valley Cr. (Sho-Ban Contract)	\$1,896,000			\$5,000	\$1,891,816		
83-415:Alturas Lake Cr.	\$347,000			\$5,000	\$368,500 <sup>1</sup>	\$6,899,000 <sup>1</sup>	19.0:1 <sup>1</sup>
84-24 :Bear Valley Cr (USFS) Elk & Marsh	\$125,400				\$125,400		
84-28 :Lemhi R.	\$1,722,700	\$11,300	50		\$1,734,000	\$2,025,000 <sup>3</sup>	0.32:1 <sup>3</sup>
84-29 :Panther Cr.	\$198,679	\$400,000 <sup>1</sup>	50		\$208,679	\$9,000,000 <sup>1</sup>	1.1:1 <sup>1</sup>

<sup>1</sup>Average of range of estimates from several alternatives or variables.

<sup>2</sup>Costs and methods used to derive these values were not provided in reports.

<sup>3</sup>Maximum of range of estimates from several alternatives.

Appendix Table E-2. (cont.)

PREDICTED BENEFITS

PROJECT NAME	VALUE PER ADULT			TOTAL	YEARS OCCURRING	DISCOUNT	PRESENT
	ESCAPE.	SPORT	COMM.	YEARLY BENEFITS		RATE (%)	VALUE TOTAL BENEFITS
<b>IDAHO</b>							
Clearwater River							
84-5 :Red River	\$359			\$445,470	1-100	4	\$10,916,242
	\$550						
:Crooked R.	\$359			\$111,500	6-100	4	\$2,245,757
	\$550						
82-1 :Clear, Orofino & Potlach Cr.							
84-6 :Lolo Cr. (83-522)							
:Eldorado Cr.							
:Upper Crooked Fk. & White Sand (83-522)							
84-31 :S.F. Clearwater Cr. Salmon River							
83-7 :Boulder Cr.							
:South Fork Salmon R.							
83-416:Pole Cr.				\$26,422 <sup>1</sup>		4	\$2,100,000
83-23 :Camas Cr.							
83-359: Bear Valley Cr. (Sho-Ban Contract)					1-50		
83-415: Alturas Lake Cr.	\$550				1-20		\$6,899,250 <sup>1</sup>
	\$18						
84-24 :Bear Valley Cr (USFS) Elk & Marsh							
84-28 :Lemhi R.		\$75	\$22	\$30,670	6-50	3	\$648,800 <sup>2</sup>
		\$125	\$42				
84-29 :Panther Cr.	\$106				1-50	7 7/8	\$9,539,500 <sup>1</sup>
	\$137						

<sup>1</sup>Average of range of estimates from several alternatives or variables.

<sup>2</sup>Maximum of range of estimates from several alternatives.