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1997

MULTI-YEAR IMPLEMENTATION PLAN

FOR THE PROTECTION, RESTORATION, AND ENHANCEMENT
OF COLUMBIA RIVER BASIN FISH AND WILDLIFE RESOURCES

Presented To

THE NORTHWEST POWER PLANNING COUNCIL
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Prepared by

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With the help and cooperation of

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Table of Contents for All Sections

| | |
|---|-----|
| 1. Executive Summary | 7 |
| 1.1 Introduction..... | 7 |
| 1.2 Purpose of the Multi-Year Implementation Plan | 8 |
| 1.3 Objectives, Strategies, and Issues Described in the Multi-Year Implementation Plan..... | 10 |
| 1.4 Next Steps to Accelerate the Implementation of Restoration Efforts..... | 25 |
| 1.5 Summary of Costs..... | 27 |
| 1.6 Scientific and Public Review of the Multi-Year Implementation Plan..... | 27 |
| 2. Summary of Fish and Wildlife Plans in the Columbia River Basin..... | 30 |
| 2.1 Proposed Recovery Plan for Snake River Salmon, Required under the Endangered Species Act and Prepared by the National Marine Fisheries Service..... | 30 |
| 2.2 The Columbia River Basin Fish and Wildlife Program..... | 33 |
| 2.3 <i>Wy-Kan-Ush-Mi Wa-Kish-Wit--Spirit of the Salmon: The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes ...</i> | 35 |
| 2.4 ISG Report | 36 |
| 2.5 U.S. Fish and Wildlife Service Biological Opinion and Draft Recovery Plan for Kootenai River White Sturgeon..... | 38 |
| 2.6 Lower Snake River Compensation Plan Program | 39 |
| 2.7 The Eastside EIS and the Upper Columbia River Basin EIS | 40 |
| 2.8 <i>United States v. Oregon</i> Columbia River Fish Management Plan | 41 |
| 2.9 Upper Columbia United Tribes Implementation Plan | 41 |
| 2.10 The Integrated System Plan..... | 44 |
| 2.11 State Wild Fish Plans | 45 |
| 2.12 National Research Council Report - UPSTREAM..... | 47 |
| 2.13 Mid-Columbia Agreements | 47 |
| 2.14 Idaho Power Agreements (FERC)..... | 47 |
| 2.15 Comprehensive Environmental Assessment | 48 |
| 2.16 Mitchell Act..... | 48 |
| 2.17 Integrated Hatchery Operations Team (IHOT) | 48 |
| 2.18 Pacific Salmon Treaty Programs..... | 49 |
| 2.19 Northwest Forest Plan..... | 49 |
| 3. Mainstem Construction (SCT) Five-Year Work Plan..... | 53 |
| 3.1 Description of Work Plan..... | 53 |
| 3.2 General Mainstem Passage Objectives | 57 |
| 3.3 Summary and Comparison of Strategies Associated with Three Major Salmon Recovery Plans -- Capital Construction Activities in Mainstem Snake and Columbia Rivers | 59 |
| 3.4 Mainstem Construction Categories..... | 68 |
| 3.5 Federal/Council and CRITFC Future System Configuration Paths | 145 |
| 3.6 Identification of Key Issues | 152 |
| 4. Mainstem Operations | 169 |
| 4.1 Approach..... | 169 |
| 4.2 Ecological Objectives..... | 170 |

| | |
|---|-----|
| 4.3 Strategies Associated with the Objectives..... | 172 |
| 4.4 Summary of Current Plans | 183 |
| 4.5 Summary of Future Activities..... | 186 |
| 4.6 Key Issues | 187 |
| 4.7 Costs | 202 |
| 5. Anadromous Fish..... | 206 |
| 5.1 Introduction..... | 206 |
| 5.2 A Conceptual Framework for Salmon Restoration..... | 210 |
| 5.3 Developing a Subregional Approach and Criteria for Prioritizing Projects | 222 |
| 5.4 Key Technical and Policy Issues..... | 241 |
| 5.5 Research, Monitoring, and Evaluation..... | 246 |
| 5.6 Influence of Human Activities on the Columbia River Basin Aquatic Ecosystem..... | 277 |
| 5.7 Distribution and Status of Anadromous Fish Species in the Columbia Basin (may be incorporated elsewhere in MYIP)..... | 288 |
| 5.8 Regional Production and Habitat Goals, Policies, Objectives, Strategies, Plans and Programs | 288 |
| 5.9 Subbasin Production and Habitat Goals, Objectives, and Strategies | 321 |
| 5.10 Production and Habitat Projects and Costs..... | 389 |
| 5.11 Basinwide Activities..... | 419 |
| 6. Resident Fish..... | 449 |
| 6.1 Executive Summary | 449 |
| 6.3 Approach..... | 456 |
| 6.4 Detailed Goals And Objectives..... | 457 |
| 6.5 Issues..... | 527 |
| 6.6 Current Resident Fish Program Costs..... | 530 |
| 6.7 References | 534 |
| 7. Multi-Year Wildlife Workplan..... | 540 |
| 7.1 Approach..... | 540 |
| 7.2 Ecological Objectives..... | 545 |
| 7.3 Summary of Current Activities | 546 |
| 7.4 Summary of Future Activities..... | 549 |
| 7.5 Wildlife Program..... | 551 |
| 7.6 Key Policy Issues..... | 557 |
| 7.7 Costs | 559 |
| 8. Budget and Implementation..... | 561 |
| 8.1 Budget Planning..... | 561 |
| 8.2 Major Policy Issues..... | 560 |
| 8.3 Public Information and Involvement..... | 563 |

Section 1 - Executive Summary

Table of Contents

| | |
|--|----|
| 1. Executive Summary | 7 |
| 1.1 Introduction | 7 |
| 1.2 Purpose of the Multi-Year Implementation Plan | 8 |
| 1.3 Objectives, Strategies, and Issues Described in the Multi-Year Implementation Plan..... | 10 |
| 1.3.1 Objectives..... | 10 |
| 1.3.2 Mainstem Construction | 11 |
| 1.3.3 Mainstem Operations | 13 |
| 1.3.4 Anadromous Fish..... | 15 |
| 1.3.5 Resident Fish | 18 |
| 1.3.6 Wildlife..... | 23 |
| 1.3.7 Annual Workplan Process | 24 |
| 1.4 Next Steps to Accelerate the Implementation of Restoration Efforts..... | 25 |
| 1.4.1 Integrate the Work of the Independent Scientific Group..... | 25 |
| 1.4.2 Develop a Framework Based on the Conceptual Foundation in the ISG Report..... | 26 |
| 1.4.3 Develop a Revised Multi-Year Implementation Plan..... | 26 |
| 1.4.4 Develop Comprehensive Recommendations for Amendments to the Columbia Basin Fish and Wildlife Program..... | 27 |
| 1.4.5 Work with NMFS on a Final Recovery Plan..... | 27 |
| 1.4.6 Implement the Provisions of the Memorandum of Agreement..... | 27 |
| 1.5 Summary of Costs..... | 27 |
| 1.6 Scientific and Public Review of the Multi-Year Implementation Plan..... | 27 |

List of Figures

| | |
|--|----|
| Figure 1- 1 Composition of 128 specific strategies for enhancement of resident fish..... | 20 |
|--|----|

List of Tables

| | |
|--|----|
| Table 1- 1 Comparison of Tribal and Federal Plans by Capital Construction Categories | 11 |
| Table 1- 2 Native and introduced resident fish species targeted for management actions under the Fish and Wildlife Program..... | 21 |
| Table 1- 3 Multi-year resident fish restoration budget projects based on total cost of all planned FY 1997 projects..... | 22 |

1. Executive Summary

1.1 Introduction

Federal, state, and tribal fishery managers and the Northwest Power Planning Council (the Council) are working together to accelerate the implementation, monitoring and evaluation of fish and wildlife measures in the Columbia River Basin. This Multi-Year Implementation Plan will identify the needs of salmon and steelhead and other anadromous fish, resident fish, and wildlife.

The plan considers all the components of the Council's Columbia River Basin Fish and Wildlife Program, the requirements of the National Marine Fishery Service's (NMFS) Biological Opinions, the tribal salmon restoration plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit--Spirit of the Salmon*, adopted by the Nez Perce, Umatilla, Warm Springs, and Yakama tribes, and other plans.

The Multi-Year Implementation Plan identifies areas where the federal, Council and tribal restoration plans are similar or complementary to facilitate coordinated implementation. It also describes areas where there are differences among the plans and identifies opportunities to resolve those differences. Some of these issues need to be resolved early in 1997 to keep implementation on schedule. These issues are identified for the Council, the National Marine Fisheries Service and the fish and wildlife managers for their consideration and policy direction.

To ensure the implementation plan is based on the best available science, this effort begins to integrate the work of the Independent Scientific Advisory Board and other scientific information into the implementation, monitoring, and evaluation of fish and wildlife restoration activities. The fish and wildlife managers have developed a conceptual framework for anadromous fish based on the conceptual foundation of the Independent Scientific Group in *Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem*. The managers have also proposed a process to review the goals, objectives, and strategies of the three plans based on the framework and to work to develop a unified approach. Fish and wildlife agencies and tribes also will request that the Independent Scientific Advisory Board review the draft implementation plan.

This is a work in progress. The fish and wildlife managers plan to refine the conceptual framework in conjunction with the Council's work on an issue paper to develop an anadromous fish framework for the Fish and Wildlife Program. The fish and wildlife managers plan to use the framework to resolve many of the conflicts and other issues identified in this document and then to prepare a revised Multi-Year Implementation Plan in mid-1997. The revised plan will be used to prepare the fish and wildlife managers' recommendations for the Council's amendments to its Fish and Wildlife Program. In addition, NMFS will use this information in the revision to its Snake River Salmon Recovery Plan.

Fish and wildlife agencies and tribes will use the information in this interim Multi-Year Implementation Plan to develop detailed annual work plans that can be used to evaluate ongoing projects and solicit proposals for new activities that are needed. This will help ensure that all fish and wildlife projects meet clear restoration objectives, are part of a comprehensive strategy, and are based on the best scientific knowledge. It will help ensure open access to the prioritization

process, independent scientific review, and completion of the work in as effective a manner as possible.

The benefits of the implementation planning process include:

- Long-term strategic planning of projects to achieve management objectives
- Tools to assist in budget planning
- Tools to develop annual work plans and project proposals
- The identification of important issues that must be resolved by policy makers
- Methods to integrate anadromous and resident fish and wildlife implementation plans into a comprehensive implementation and budget allocation process
- A process to refine the framework, goals and objectives
- A process to link project criteria and priorities to the framework

A public information and involvement effort will promote the participation of interested parties in this effort.

1.2 Purpose of the Multi-Year Implementation Plan

The three driving forces to develop a Multi-Year Implementation Plan for Columbia Basin fish and wildlife restoration are (1) the need to coordinate and consolidate the agreed-upon activities called for in various state, regional, and tribal restoration plans with ESA recovery plans and biological opinions; (2) the Council's program calling for implementation planning; and (3) the Memorandum of Agreement for Bonneville fish and wildlife project funding recently signed by the Department of Energy, the Department of the Interior, the Department of Commerce, and the Department of the Army calling for multi-year implementation plans. The MOA also commits to consultations with Pacific Northwest Indian tribes.

The Council has recognized the need for the coordination of regional fish and wildlife enhancement activities and integration of specific elements into a multi-year comprehensive implementation plan:

“To be effective, the fish and wildlife program must be more than a collection of unrelated measures. Individual efforts must be coordinated, and program measures need to support the ongoing efforts of tribal, state and federal fish and wildlife managers in the basin. All goals, principles, priorities and specific objectives in the program are to be integrated.”

The Council calls for an Annual Implementation Workplan to include a list of ranked projects demonstrating that the program is being implemented.

The purpose of the annex to the federal Memorandum of Agreement is to provide for more effective regional involvement and accountability in the expenditure of ratepayer money for fish and wildlife mitigation. It identifies methods for assuring the availability of information for monitoring budget management and program effectiveness and for prioritizing future program

activities. In the annex, the federal and state agencies, the Council, and the tribes commit to work together to improve budget management and program effectiveness.

Since there are more opportunities for fish and wildlife restoration than money available, it is imperative that there be a coordinated regional plan that will optimize the use of available funds in the current budgets allocated to anadromous fish, resident fish and wildlife. The fish and wildlife managers are not proposing any change in the budget allocation formula adopted by the Council and agreed to by the managers. An annual ranking process is in place to review projects for implementation each year, but the process has lacked a guiding framework. Development of this framework through multi-year work plans will be consistent with funding under the Memorandum of Agreement.

The Council and the fish and wildlife agencies and tribes agreed to develop a multi-year implementation plan. The Pacific Northwest tribes are co-managers of the fish and wildlife resources. Some of the tribes have made it clear that they do not support all parts of the Multi-Year Implementation Plan; however, these tribes have committed to participate in the implementation planning process.

The agencies and tribes are working through an interagency steering committee to guide the planning efforts of technical teams of biologists, engineers, and other disciplines. The individual teams are developing a multi-year road map that will guide the region's investment in fish and wildlife by describing the work that needs to be done, identifying gaps in knowledge, and assuring coordination of activities. The steering committee has compiled the work of the individual groups into a single work plan.

There is a great deal of commonality among the state, federal, and tribal plans. The effort has focused on moving ahead in these areas of agreement and describing issues in disagreement for subsequent resolution by regional policy makers. For example, the Council anticipates using this effort to frame issues for possible amendments to its fish and wildlife program, and NMFS expects to be able to use information from this process in the development of its final Snake River Salmon Recovery Plan.

The Multi-Year Implementation Plan consists of sections that parallel the emphasis of the several planning documents. The sections contain statements of objectives, brief project descriptions and costs for the work outlined, identification of research needs, and an implementation schedule through the year 2001.

The programmatic sections of the implementation work plans -- Mainstem Construction, River Operations, Anadromous Fish, Resident Fish, and Wildlife -- include ecological and management objectives, progress reports on ongoing actions, future actions needed to advance fish and wildlife restoration, schedules for these actions, and the necessary monitoring and evaluation components. The implementation plan together with these and other elements will be used to identify the work that needs to be accomplished each year.

The Multi-Year Implementation Plan will also serve as a guide for those submitting proposals for restoration work or research. The proposals will be evaluated in the annual ranking process based on objective criteria, including consistency with the multi-year implementation framework, scientific soundness, and cost effectiveness. The evaluation process will be competitive in that the highest-ranked projects will be considered for funding by the CBFWA in its prioritization process. The fish and wildlife agencies and tribes will develop annual restoration work plans based on the implementation framework, the projects funded for that year, and the monitoring and evaluation results of the previous years' activities.

The fish and wildlife managers have begun the effort of integrating the work of the Independent Scientific Group into the Multi-Year Implementation Plan. The ISG report, *Return to the River*, was completed too late to be fully incorporated into this document. The fish and wildlife managers have prepared a conceptual framework that is based on the conceptual foundation contained in the ISG report. The fish and wildlife managers will work with the Independent Scientific Advisory Board and the Council to refine the framework in this document and link it to unified goals, objectives and strategies.

This new framework will be used to revise the Multi-Year Implementation Plan and propose resolution of issues where the current plans are in disagreement. The framework and the revised Multi-Year Implementation Plan will be used to develop the fish and wildlife managers' recommendations to amend the Council's Fish and Wildlife Program and to complete the Recovery Plan for Snake River Salmon.

A note to reviewers: The rest of the executive summary has been revised based on the new sections that are in the Internal draft. **Please review this material to ensure that it accurately summarizes the substance of those sections. We are also looking for comments on whether these summaries address the key ideas in each section.**

1.3 Objectives, Strategies, and Issues Described in the Multi-Year Implementation Plan

1.3.1 Objectives

The overall objectives of the NMFS Biological Opinion, the Council's Fish and Wildlife Program, and the Spirit of the Salmon plan developed by the Nez Perce, Umatilla, Warm Springs, and Yakama tribes, differ significantly. The Biological Opinion focuses primarily on restoration of Snake River salmon stocks that are listed under the Endangered Species Act, although the Biological Opinion supports the concept of an ecosystem approach. The Council's Program goal is to protect, mitigate and enhance all Columbia Basin fish and wildlife affected by the construction and operation of the hydroelectric system. The objectives of Spirit of the Salmon are to halt the decline of all anadromous fish, including salmon, sturgeon and lamprey, and rebuild fish populations to permit sustainable levels of tribal harvest consistent with Treaty rights.

Section 2 of this Multi-Year Implementation Plan summarizes the fish and wildlife plans that have been developed to guide restoration efforts. The other sections describe ecological and/or

management objectives for the activities to be implemented. A number of the specific objectives are quite similar among the plans.

1.3.2 Mainstem Construction

Section 3 contains two fundamentally different investment strategies for the \$600 million allocated to the Corp’s general construction fund between 1997 and 2001 as provided under the Memorandum of Agreement.

The approach of the federal agencies and the Council is to pursue interim improvements in juvenile screen and bypass systems, and new barges and loading facilities. This strategy also includes engineering, development, and prototype testing of surface bypass systems and completion of a feasibility study for Lower Snake River drawdowns by December 1999. Although no work is currently scheduled to evaluate Columbia River drawdowns, the System Configuration Team plans to begin an evaluation of a deep drawdown of John Day reservoir in FY 1997, pending Congressional approval of the scientific justification for such studies. The federal/Council approach has also identified three scenarios for long-term improvements in migration survival: drawdowns, in-river bypass, and transportation.

Under the federal/Council approach about 57 percent of the expenditures through 2001 would go to fish bypass facilities improvements, 25 percent to surface bypass prototype testing, 10 percent to dissolved gas abatement, 5 percent for studies of drawdowns at Columbia and Snake river dams, 3 percent for juvenile fish transportation and 1 percent for adult passage improvements.

The approach of the Columbia River Inter-Tribal Fish Commission and the Shoshone-Bannock Tribe is based on the Spirit of the Salmon. It would reallocate the \$207 million currently budgeted for bypass and surface collectors at Lower Snake River dams and John Day Dam and use these funds for early implementation of a drawdown to spillway at John Day Dam and natural river drawdowns at the four Lower Snake River federal dams. The tribal approach would also implement changes in stilling basins to reduce dissolved gas levels at all dams, and would implement surface bypass systems on the lower Columbia River dams. These tribes also call for improvements in adult fish facilities.

The approach of the Columbia River Inter-Tribal Fish Commission and the Shoshone-Bannock Tribe would allocate 55 percent of the funding to Snake River drawdowns, 17 percent for gas abatement and temperature control, 14 percent to install surface bypass systems on Lower Columbia River dams and spill efficiency improvements at all dams, seven percent to adult passage improvements, and three percent to John Day drawdown. Their approach does not allocate any funds to juvenile screen bypass or transportation improvements.

Table 1- 1 Comparison of Tribal and Federal Plans by Capital Construction Categories

| Category | Tribal Plan | Federal Plan |
|---------------------------------------|--------------------|---------------------|
| Surface Bypass and Spill Efficiency | \$ 86 | \$ 149 |
| Gas Abatement and Temperature Control | \$ 109 | \$ 60 |
| Snake River Drawdowns | \$ 351 | \$ 16 |

| | | |
|--|---------------|---------------|
| John Day Drawdown | \$ 22 | \$ 12 |
| Adult Passage | \$ 44 | \$ 6 |
| Juvenile Screen Bypass Improvements and Transportation | \$ - | \$ 363 |
| Other (studies, monitoring) | \$ 23 | \$ 6 |
| Totals | \$ 635 | \$ 611 |
| All figures in millions of dollars | | |

Key Issues: The region’s policymakers need to resolve the significant differences between these two approaches as soon as possible. The Columbia River Inter-Tribal Fish Commission and the Shoshone-Bannock Tribe believe their approach is consistent with the ISG report *Return to the River* and is based on the best available science. They are concerned that their approach is being seriously compromised by the current funding plan and that over \$200 million will be spent on fish bypass systems that will become obsolete when drawdowns are implemented in the future. Section 3.6 describes this issue in detail and provides analysis of the advantages and disadvantages of each approach for policymakers.

Section 3.6 describes a possible compromise proposed by the Columbia River Inter-Tribal Fish Commission and the Shoshone-Bannock Tribe between these two approaches. Until a unified long-term system configuration plan is agreed to, the compromise suggests funding only those mainstem capital construction activities that are common to the Spirit of the Salmon, the Council’s 1994 Fish and Wildlife Program, and the NMFS 1995 Biological Opinion. These measures that are common to all three salmon recovery plans are identified in Table 3-2 (Section 3.3). This approach has not been developed in the draft work plan.

The federal/Council plan and the Columbia River Inter-Tribal Fish Commission and Shoshone-Bannock Tribe plan use different decision criteria. The region needs to determine the appropriate decision criteria for mainstem construction as part of a process to resolve the differences between the two approaches. In Section 5.5.3.2, fish and wildlife staff working on the PATH (Plan for Analyzing and Testing Hypotheses) project have proposed survival goals and other decision criteria. They have also developed an analytical approach to evaluating mainstem construction decisions. This proposal could be evaluated as a potential unified decision criteria and process.

The fish and wildlife managers have also identified the importance of evaluating system configuration decisions based on their effects on all anadromous and resident fish and wildlife. For example, some drawdown configurations may reduce the fluctuations in upper basin storage reservoirs and provide additional habitat for wildlife.

Sections 3.4 and 3.6 also describe important schedule issues. The NMFS 1995 Biological Opinion identifies immediate, intermediate, and long-term actions for the operation and configuration of the hydropower system that will reduce mortality of ESA-listed fish. NMFS calls on the Corps to complete an interim evaluation of the long-term measures by mid-1996 and to proceed with the engineering and design work for a preferred drawdown alternative and development of surface bypass systems, unless NMFS and the Corps agree on a different course. The interim evaluation was completed in December 1996, about six months behind schedule.

A report on the engineering and design work and the NEPA process are to be completed by December 1999, and Congressional authorization is to be pursued. The NMFS goal is to ensure that construction of drawdown or surface bypass systems in the Snake River could begin in 2000. To meet this construction time frame, however, Congressional authorization, if needed, and necessary Corps funding to implement such actions would need to be obtained in 1998--about a year before the engineering and design report is scheduled to be completed.

The schedule for drawdown at John Day Dam is on hold, pending Congressional review of the biological justification for this project that was prepared by NMFS in December, 1996. The earliest schedule for a preliminary evaluation would be 1999. There is no schedule to complete detailed engineering and design.

The tribes are concerned that the current schedule will not result in significant survival improvements in time to avoid extinction of some stocks. They also cite recent studies that indicate substantial cost savings can be achieved by an early decision to draw down the dams they have identified.

Section 3.6 identifies a number of other important procedural and technical issues that need to be resolved if implementation is to stay on schedule, and describes five processes that could be used to resolve these important issues:

1. NMFS' process, created in the 1995 Biological Opinion, for plan integration and dispute resolution
2. Upcoming Council Fish and Wildlife Program Amendment Process
3. Congressional or Administration directives
4. Legal challenges and judgments or settlements
5. Separate dispute resolution process

This section also contains a detailed comparison of the three plans. The sections on the federal/Council approach and the Columbia River Inter-Tribal Fish Commission and Shoshone-Bannock Tribe approach provide a description of the workplans by major category, a list of current research, monitoring, and evaluation activities, project details for each dam, and a description and costs for the major long-term system configuration alternatives.

1.3.3 Mainstem Operations

Section 4 of the Multi-Year Implementation Plan describes the ecological objectives for anadromous and resident fish affected by the operation of the Federal Columbia River Power System (FCRPS). It also describes FCRPS operations to achieve those objectives. Presently, operations of the FCRPS are guided by the biological opinions developed under the Endangered Species Act.

Objectives: A primary objective of mainstem operations for anadromous salmon is to increase the survival of juveniles, whether transported or migrating in-river, and adults. A primary objective

for resident fish is to maintain and improve habitat integrity, quality, and quantity. Much of the work focuses on implementing measures to protect anadromous and resident fish and wildlife.

The ecological objective of the Biological Opinion for Snake River salmon is to increase egg-to-adult survival by 100 percent to 300 percent depending on the stock. The Council's Fish and Wildlife Program and individual management plans of Indian tribes and states also describe FCRPS operations to meet objectives for other fish and wildlife.

Strategies: Sections 4.3 and 4.4 describe the operational strategies for the FCRPS to meet the objectives for both anadromous and resident fish. Implementation of these strategies is facilitated in forums established by the Biological Opinion, including the Technical Management Team, the Implementation Team and the Executive Committee. The strategies describes are spill, flow augmentation, and drawdowns.

Spill increases fish passage efficiency, reduces project-specific mortality, and decreases passage time through each project. Spill is managed within the constraints of dissolved gas monitoring and adult passage requirements to achieve 80 percent fish passage efficiency (i.e. the percentage of fish going past the dam via a route that does not go through a turbine).

Flow augmentation is implemented to reduce fish travel time through the hydroelectric system. The effects of flow levels on fish travel time and survival have been and continue to be studied throughout the basin.

Drawdowns reduce the cross section of mainstem reservoirs to increase water velocity, thereby reducing travel time and increasing survival. The four Lower Snake River dams are lowered several feet to near-minimum operating pool (all functions of the dam continue to operate), and John Day Dam is lowered to its minimum irrigation pool.

Key Issues: Section 4.6 describes the key operational issues. The most important policy issue is whether mainstem operations will continue to implement the Biological Opinion requirements over other objectives when the plans conflict. Some parties are concerned that no authority or process exists to resolve conflicts or find compromises among the various plans.

If the Biological Opinions remain the only authoritative prescription for mainstem operations, then the Technical Management Team will be the appropriate group to implement hydropower operations. If policy makers decide to broaden the TMT mandate to include the river operation provisions of other plans, the current structure may need a conflict resolution process and potentially broader representation.

The most significant conflicts are between flow augmentation for anadromous fish and maintaining the biological requirements for resident fish in storage reservoirs (e.g. the reservoirs behind Libby, Hungry Horse, Grand Coulee, and Dworshak dams) and other mainstem reservoirs.

Flow augmentation operations reduce the water level in storage reservoirs and affect the food web by decreasing food production. Significant reservoir withdrawals can also cut off access to spawning areas in tributaries.

The NMFS Biological Opinion contains limits on reservoir operations primarily designed to increase the water supplies available for flow augmentation for anadromous fish. The Council's Fish and Wildlife Program includes Integrated Rule Curves for Libby and Hungry Horse reservoirs and limitations on fluctuations at Grand Coulee Dam to protect resident fish, in combination with reservoir drawdowns to increase salmon migration survival.

The Biological Opinion and the Integrated Rule Curves differ significantly during the summer period. The IRCs are designed to fill Libby and Hungry Horse reservoirs in July and maintain that level throughout the summer. The Biological Opinion often results in drafts of 20 feet by the end of August. This operation reduces the probability that the reservoirs will refill, decreases biological production during the warm months, and causes unnatural fluctuations in the discharges to the Kootenai and Flathead rivers downstream from these projects.

Two efforts are underway that may help resolve this conflict. The Independent Scientific Advisory Board has been requested to examine this issue. The ISAB will report in March. The scope of this examination, however is controversial. Some have proposed asking if current operations will increase the probability of extinction for resident fish in the reservoirs. Others have asked for an assessment of the risks to resident fish compared to benefits for anadromous fish. Still others want the ISAB to determine whether the current operations are consistent with the standards of the Northwest Power Act.

In a second effort, the Corps of Engineers is currently studying the "Variable Q" flood control proposal for Libby Dam. Under this proposed operation Libby would not be drafted as deeply in the spring for system flood control. This could complement the Integrated Rule Curve operation for this reservoir.

The Council's program also limits reservoir fluctuations and flows through Lake Roosevelt to protect the food production in the reservoir. Operations under the NMFS Biological Opinion often exceed these limits. Mitigation and monitoring programs are being implemented to address some of the impacts on Lake Roosevelt caused by hydroelectric and salmon operations.

Another cross-cutting issue is the effect of spill and temperature control programs on resident fish and wildlife. All anadromous and resident fish can be damaged by high dissolved gas levels. High water temperatures can kill anadromous fish. Significant changes in temperature or flows can damage local resident fish and wildlife populations.

1.3.4 Anadromous Fish

Section 5 starts with a conceptual framework for salmon restoration based on the conceptual foundation of the Independent Scientific Group's recent report *Return to the River*. The conceptual framework is the first step in responding to both the ISG report and the federal Memorandum of Agreement. It consists of three parts:

The biological framework - a sequence of relationships among any event or action taken by humans, changes in environmental conditions, biological performance (e.g. capacity, productivity and diversity), and the status of resources. The flow of information through these relationships is bi-directional.

The tasks necessary to act consistent with the biological framework - including a description of the problem, formulation of goals and objectives, allocation of resources, identification of actions, and monitoring and evaluation of the results.

A set of common tools to carry out the tasks - including information management, technical analysis, and communications. These tools provide the information feedback necessary to implement an adaptive management process.

This is a work in progress. The conceptual framework in this document needs to be refined. The fish and wildlife managers then need to link a unified set of goals, objectives, and strategies to the framework. The section lays out a schedule to refine and extend the description of the conceptual framework, summarize current activities in relation to the biological framework, assign responsibilities to conduct various tasks, and set priorities for funding.

Section 5 describes a process to develop a comprehensive watershed assessment that identifies key habitat and corridors for anadromous fish, resident fish, and wildlife for each subregion in the Columbia Basin. A comprehensive approach should be based on established methodologies to identify carrying capacity and limiting factors in each watershed. The approach will need to address all of the species and all of the lands in each watershed. Everything that goes on in a watershed bears some relationship to the whole, and restoration efforts in one part of the watershed can be frustrated by damaging actions in other parts of the drainage area.

Watershed planning can produce benefits for all species. Improving riparian habitat will benefit spawning and rearing for anadromous and resident fish. More salmon and resident fish will benefit predators such as eagles, otters and bears. Improving streamside habitat will also benefit wildlife.

The section describes a proposal by the Council and the Columbia River Inter-Tribal Fish Commission for a subregional approach to the Columbia River Basin. This approach would bring together the policies, objectives, and priorities of local watershed-based efforts with the policies, objectives, and priorities at the regional level. The Council and CRITFC proposal also includes a process to prioritize habitat and production projects among and within watersheds in the basin. The Council and CRITFC have identified several alternatives for making the transition to a subregional approach.

CRITFC has also proposed a process to set priorities and establish criteria for watershed habitat and production activities. The proposals by the Council and CRITFC will be discussed by the fish and wildlife managers as they work to incorporate the conceptual framework into fish and wildlife implementation.

Much has been done, but more work is needed to develop a comprehensive watershed approach. In developing this first Multi-Year Implementation Plan, fishery managers used the subbasin plans originally developed in 1987 as the basis for the ecological objectives and strategies for anadromous fish. A compilation of the subbasin plans and other plans can be found in Appendix 1: *Subbasin Habitat and Production Objectives and Strategies for Anadromous Fish*.

While this material provides a useful set of activities, it needs to be linked to the framework. This will improve the ability to set priorities among subregions and within subregions for production and habitat activities.

Fish and wildlife managers, working with the Northwest Power Planning Council and others, expect to complete the framework early in 1997, and complete comprehensive watershed assessment and planning work by _____. This effort will be incorporated into the next version of the Multi-Year Implementation Plan. In the future, annual workplans will be developed using the principles and criteria developed in the Multi-Year Implementation Plan.

Watershed restoration requires the active involvement of all of the people with interests in the watershed. Fish and wildlife managers will work with other federal, state, and tribal entities and will seek the active participation of local groups and land owners. This will require leadership by the fish and wildlife managers. It will also require a delivery and support system to coordinate local level actions with regional plans and resources.

This section also identifies the information-gathering actions that are needed to make key restoration decisions, and the activities needed to resolve critical uncertainties and to improve overall understanding of restoration strategies and their effectiveness.

Millions of dollars are spent annually on fisheries research. The major restoration plans have similar information needs. The plans recognize that there are critical uncertainties or hypotheses associated with proposed actions. An aggressive adaptive management approach is a common theme of the restoration plans. Improving the coordination of research, monitoring, and evaluation could increase the region's ability to supply needed information for these restoration efforts.

This section also describes a long-term monitoring program that will compare the performance of fish and wildlife measures for indicator stocks across a number of years. This will allow fish and wildlife managers to evaluate the success of various restoration techniques and make adjustments to activities that are not meeting expectations.

In addition, Section 5 provides an overview of the regional and subbasin production and habitat goals, policies, objectives and strategies contained in the three plans and other federal and state plans. The fishery managers have combined production and habitat activities in one section to improve the coordination of these actions. The section also identifies areas of agreement and disagreement in the various plans.

Finally, Section 5 describes basin-wide efforts to coordinate actions, collect data, or inform the public and the decision-making process. The coordination section provides descriptions of the roles and functions of the principal entities involved in planning and implementation of fish and wildlife measures. Some of these entities receive funding directly from BPA. The information section describes activities to collect, maintain, and disseminate information to researchers, managers, and the public. The special projects section contains efforts that involve more than one management entity, such as the law enforcement program and the predator control program to evaluate the effectiveness of managing large-mouth minnows.

Key issues: Section 5.4 describes the key management and implementation issues that need to be resolved to improve watershed restoration and production.

Differences in the production and habitat goals, objectives, and strategies reflect the basic differences in the three plans. Management responsibilities drive the scope of the three plans. The production goals of the Spirit of the Salmon are higher than the other plans because of the management focus to restore historical tribal fisheries. The NMFS plan addresses species listed under the Endangered Species Act, while the Fish and Wildlife Program and Spirit of the Salmon include all wild and hatchery stocks in the basin.

The fishery managers will continue to balance these restoration and conservation needs through the Production Advisory Committee under *U.S. v Oregon*. Discussions will center on reaching agreement on regional and subbasin production goals, objectives, and strategies that address appropriate hatchery broodstocks; reprogramming existing hatcheries versus building new facilities; the use of hatcheries to supplement natural production; and the effects of hatchery practices on natural fish populations.

The fishery managers need to reach agreement on how various strategies will meet the goals and objectives. They also need to determine how success will be measured. Fish and wildlife managers also recognize that production and habitat activities can affect other restoration efforts. For example, if habitat projects reduce water temperatures in the tributaries, mainstem temperatures will also decrease.

The fishery managers will need to determine funding allocations for hatcheries. This effort must address how to retrofit some existing facilities, how to relocate and redistribute production, and how to cover those costs under existing or reduced budgets. The managers must also determine the appropriate allocation of funds to maintain and rebuild habitat.

Finally, the issues section describes the role of the tribes as co-managers of the fishery resources. The tribal co-managers want to participate with parity in decisions regarding fish production. They want to accelerate current administrative processes that have delayed transfers of production facilities and funding to areas that support tribal fisheries.

1.3.5 Resident Fish

Section 6 addresses mitigation and enhancement measures for freshwater fish and measures to substitute resident fish for salmon populations permanently lost due to construction and operation

of the federal hydropower system. The section includes general goals for resident fish management, species and subregion- or subbasin-specific management objectives, strategies to achieve those objectives, critical hypotheses, and performance measures. The section also identifies resident fish projects funded in FY 97 and the schedule for project completion. In future versions of the Multi-Year Implementation Plan, many of the resident fish production and habitat activities will be integrated into subregional or watershed plans to ensure coordinated implementation.

The resident fish plan is one part of a comprehensive, long-term, integrated implementation plan for all fish and wildlife enhancement and recovery activities within the region. Using a subregional/subbasin ecosystem framework, the resident fish managers in conjunction with Council staff collected baseline information on project summary templates. The information identified management objectives, priorities, and policy issues for resident fish species. This database provides a tool for systematic tracking and analysis of long-term project implementation with respect to alignment with strategic goals and objectives. Detailed information can be found in Appendix 6.3.

The overall management strategies for resident fish are the following:

- Protect, maintain, and enhance native resident fish populations and their habitats.
- Protect, maintain, and enhance non-native fish populations in waters unsuitable for native species.
- Establish, maintain, and enhance fish assemblages (both native and non-native species complexes) that maximize productivity and stability while providing sustainable consumptive and non-consumptive resident fisheries.
- Replace lost fisheries with the appropriate native or non-native resident fish, depending on type and availability of habitat, food, and other species.
- Conduct research to better understand critical uncertainties and determine the best methods for resident fish protection and enhancement.
- Monitor and evaluate actions designed to enhance resident fish populations in order to maximize the cost-effectiveness of the overall resident fish program and to maximize basinwide resident fish opportunities.

Figure 1-1 shows the composition of 128 specific strategies for enhancement of resident fish. The categories are expressed as a percentage of total unique strategies. Coordinated habitat and production projects comprise about 32 percent of all individual restoration strategies identified by resident fish managers. Research, monitoring and evaluation constitute another 24 percent of the strategies. River system changes represent 18 percent, planning and modeling 12 percent, species alterations 9 percent, enforcement 3 percent and public awareness 2 percent.

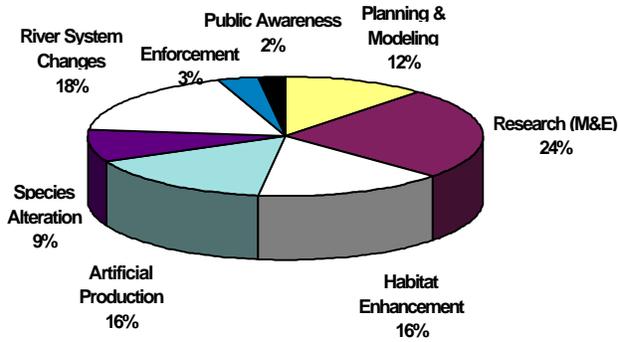


Figure 1- 1 Composition of 128 specific strategies for enhancement of resident fish

Management objectives for resident fish restoration and the corresponding strategies and actions are planned and implemented within an ecosystem framework (See Section 6.5). For purposes of managing resident fish populations, the Columbia Basin is divided into six subregions. Each of these subregions is further subdivided into several subbasins (based on hydrologic units). Resident fish managers have identified fish populations (i.e., species within a management unit) that are targeted for restoration actions (Table 1-2). Native species that are given top priority for mitigation actions throughout all or most of their range are white sturgeon, Kootenai River white sturgeon, bull trout, and redband trout. In specific subregions mitigation is planned for westslope cutthroat trout, Yellowstone cutthroat trout, kokanee, mountain whitefish, arctic grayling, and burbot. Substitution rainbow trout, yellow perch, smallmouth bass, and largemouth bass is planned in specific subbasins in areas above dams where anadromous fish migrations have been blocked.

Table 1- 2 Native and introduced resident fish species targeted for management actions under the Fish and Wildlife Program

Species targeted for management action in a subregion are denoted with a 'P'. Mitigation actions are denoted with an 'M'. Substitution actions are denoted with as 'S'.

| Species | Genus Species | ESA Status ¹ | Subregion ² | | | | | |
|--|-------------------------------------|-------------------------|------------------------|-----|-----|-----|-----|-----|
| | | | LCR | LMC | UMC | UCR | LSR | USR |
| Sturgeon | | | | | | | | |
| White sturgeon ³ | <u>Acipenser transmontanus</u> | | P | PM | PM | PMS | PM | PM |
| Kootenai white sturgeon ³ | <u>A. transmontanus spp.</u> | E | | | | PM | | |
| Salmon & Trout | | | | | | | | |
| Bull trout ³ | <u>Salvelinus confluentus</u> | W | PM | PM | P | PMS | PM | PM |
| Red Band / rainbow trout ⁴ | <u>Oncorhynchus mykiss spp.</u> | R | P | PM | PM | PMS | PM | PM |
| Westslope cutthroat trout ⁴ | <u>Oncorhynchus clarki lewisi</u> | d | | | P | PMS | PM | P |
| Yellowstone cutthroat trout ⁴ | <u>Oncorhynchus clarki bouvieri</u> | d | | | | | | PM |
| Lahontan cutthroat trout ⁵ | <u>Oncorhynchus clarki henshawi</u> | T | | | | PS | | P |
| Coastal cutthroat trout ³ | <u>Oncorhynchus clarki clarki</u> | | P | P | | | | |
| Brown trout ⁵ | <u>Oncorhynchus trutta</u> | | | P | P | P | P | P |
| Brook trout ⁵ | <u>Salvelinus fontinalis</u> | | | P | P | PS | P | P |
| Lake trout ⁵ | <u>Salvelinus namaycush</u> | | | | P | P | P | P |
| Kokanee ⁴ | <u>Oncorhynchus nerka spp.</u> | | P | P | P | PMS | PM | P |
| Mountain whitefish ³ | <u>Prosopium williamsoni</u> | | P | P | P | P | P | P |
| Pigmy whitefish ³ | <u>Prosopium coulteri</u> | | | | | P | P | P |
| Lake whitefish ⁵ | <u>Coregonus clupeaformis</u> | | | | P | P | P | P |
| Arctic grayling ⁴ | <u>Thymallus arcticus</u> | d | | | | P | P | P |
| Codfish Family | | | | | | | | |
| Burbot ³ | <u>Lota lota</u> | d | | | P | PM | | |
| Perch Family | | | | | | | | |
| Yellow perch ⁵ | <u>Perca flavescens</u> | | P | P | PS | PS | P | P |
| Walleye ⁵ | <u>Stizostedion vitreum vitreum</u> | | P | P | PS | PS | | |
| Sunfish Family | | | | | | | | |
| Largemouth bass ⁵ | <u>Micropterus salmoides</u> | | P | P | PS | PMS | P | P |
| Smallmouth bass ⁵ | <u>Micropterus dolomieu</u> | | P | P | PS | P | PMS | P |
| Crappie ⁵ | <u>Pomoxis spp.</u> | | P | P | PS | P | P | P |
| Pike Family | | | | | | | | |
| Northern pike ⁵ | <u>Esox lucius</u> | | | | | P | | |
| Catfish Family | | | | | | | | |
| Channel catfish ⁵ | <u>Ictalurus punctatus</u> | | P | P | PS | P | P | P |

¹E = endangered, W = warranted but precluded, R = status review, d = depleted, T = threatened.

²LCR = Lower Columbia River and tributaries downstream from Bonneville Dam; LMC = Mid-Columbia River and tributaries between Bonneville Dam and the Snake River; UMC = Mid-Columbia River and tributaries between the Snake River and Chief Joseph Dam; UCR = Upper Columbia River and tributaries upstream from Chief Joseph Dam; LSR = Lower Snake River and tributaries downstream from Hells Canyon Dam; USR = Upper Snake River and tributaries upstream from Hells Canyon Dam

³ Native species throughout basin.

⁴ Native species in some areas of the basin and introduced in other portions.

⁵ Introduced species throughout basin.

Budget projections for resident fish first priority projects in six subregions of the Columbia River Basin, 1997-2006, are presented in Table 1-3. The total currently funded budget of \$15.5 million for FY 1997 is distributed among the subregions as follows: Lower Columbia River, 0.3%;

Lower Mid-Columbia River, 5%; Upper Mid-Columbia River, 5%; Upper Columbia River, 48%; Lower Snake River, 10%; Upper Snake River, 31%.

Table 1- 3 Multi-year resident fish restoration budget projects based on total cost of all planned FY 1997 projects

| Budget Estimate Subtotals -- by Subregion | 1997 | | | Out-Year Budget Projections ¹ | | | | |
|--|-----------------|----------------|-----------------|--|-----------------|-----------------|-----------------|-----------------|
| | Funded | Un-funded | Total | 1998 | 1999 | 2000 | 2001 | 2002 |
| Lower Columbia | \$48 | \$16 | \$64 | \$66 | \$68 | \$70 | \$72 | \$74 |
| Lower Mid-Columbia | \$844 | \$1,650 | \$2,495 | \$2,570 | \$2,647 | \$2,726 | \$2,808 | \$2,892 |
| Upper Mid-Columbia | \$765 | \$0 | \$765 | \$788 | \$811 | \$836 | \$861 | \$887 |
| Upper Columbia | \$7,479 | \$5,314 | \$12,794 | \$13,178 | \$13,573 | \$13,980 | \$14,400 | \$14,832 |
| Lower Snake | \$1,609 | \$279 | \$1,889 | \$1,945 | \$2,004 | \$2,064 | \$2,126 | \$2,190 |
| Upper Snake | \$4,741 | \$751 | \$5,492 | \$5,657 | \$5,826 | \$6,001 | \$6,181 | \$6,367 |
| Total | \$15,486 | \$8,011 | \$23,498 | \$24,203 | \$24,929 | \$25,677 | \$26,447 | \$27,240 |

All figures in thousands of dollars

Key Issues: The resident fish managers have also identified a number of issues that need to be resolved in Section 6.7. There are a number of issues that involve interactions among resident fish, anadromous fish, and wildlife restoration. Many of these issues have been described in the mainstem construction and operations summaries above.

Resident fish managers have identified management issues by subregion, subbasin, and fish population. The major policy issues identified are the following:

- Impacts of the operation of the Federal Columbia River Power System (FCRPS) -- including flow augmentation to benefit anadromous salmon as mandated by the NMFS FCRPS Biological Opinion on resident fish populations.
- Balance between the flow augmentation regimes to benefit ESA-listed Snake River salmon and ESA-listed Kootenai River white sturgeon; specifically, the detrimental impacts of a second flow peak in the Kootenai River in August (two periods of de-watering) on the biological system -- especially potential stranding and food-web effects on juvenile sturgeon.
- Operation and modification of specific mainstem dam projects (e.g., river flows, gas saturation, and reservoir level regimes) according to criteria--such as Biological and Integrated Rule Curves, water quality standards and flow criteria--that will mitigate the impacts on resident fish species.
- The need for loss assessments of anadromous and resident fish populations and their habitats in all subregions.
- Mitigation for loss of resident fish species production resulting from hydrosystem construction and operations and associated habitat degradation.

¹ Budget projections for 1998-2002 are based on annual increase of 3 percent from the baseline of all planned resident fish projects (i.e., currently funded + unfunded).

- Watershed protection to ensure persistence of existing native resident native fish populations.
- Watershed restoration as mitigation for the degradation of critical habitat of several endemic resident fish and invertebrate species (e.g., bull trout, redband trout, westslope cutthroat trout, mountain & pigmy whitefish, burbot, and snails) across most subregions and subbasins.
- Substitution of resident fish species (native and exotic species) for losses of anadromous salmonid production caused by migration blockage.
- Increased fisheries values and opportunities for both sport fisheries and tribal ceremonial and subsistence fisheries guaranteed by Treaty Rights and Executive Orders.
- Enforcement of federal, tribal, and state laws pertaining to fish habitat and fishing regulations.

1.3.6 Wildlife

The Council's Fish and Wildlife Program goal is to achieve and sustain levels of habitat and species productivity to fully mitigate the wildlife losses associated with the construction and operation of the hydroelectric system. The wildlife managers have conducted detailed loss assessments for each of the hydroelectric dams in the Columbia Basin. Section 7 describes the wildlife plans to address these losses.

Objectives: The wildlife plan links the overall wildlife goal to specific objectives to replace the losses. Section 7 also includes a schedule for completing activities identified for implementation over the next five years.

Strategies: Since 1989, mitigation agreements have been adopted to address the construction of Hungry Horse and Libby dams in Montana and Dworshak Dam in Idaho. A five-year interim agreement has been developed for wildlife mitigation in Washington. A variety of specific Oregon projects are being implemented. Mitigation is based on restoring equivalent habitat near the site of the dam.

Key Issues: Section 7 describes key policy issues that need to be resolved. To date, wildlife efforts have focused on mitigation for inundation losses caused by the construction of dams. Wildlife have also been damaged by the loss of anadromous and resident fish and by the operation of dams. Wildlife managers recommend addressing ecosystem losses through watershed restoration efforts. Reestablishing functional ecosystems should mitigate for secondary wildlife losses. The wildlife managers have prepared a plan for quantifying losses caused by the operation of the hydroelectric system. This work will be completed in FY 98 and should lead to efforts to quantify operational effects.

Wildlife managers are working to determine specific policies and procedures for allocating funding and responsibilities under the federal Memorandum of Agreement. Resolution is expected in the first half of 1997. As part of this effort, the managers are developing criteria for evaluating and ranking operations and maintenance activities for proposed projects and for reviewing the progress of approved projects. Managers are also exploring funding agreements at the subregional level, similar to the trust funds used for some wildlife projects. This work will be completed by the end of 1998.

Wildlife managers will also develop strategies to work with non-federal licensees and the Federal Energy Regulatory Commission to ensure consistency with the Council's wildlife provisions in dam relicensing proceedings.

1.3.7 Annual Workplan Process

Section 8 describes how fish and wildlife managers will use the Multi-Year Implementation Plan to develop Annual Workplans. The section describes the budget allocations under the federal Memorandum of Agreement and a process to identify the work that needs to be done, evaluate ongoing projects to determine whether they are consistent with future needs, and solicit new work that is needed to meet priority objectives. The section also describes how these efforts will be reviewed by the Columbia Basin Fish and Wildlife Authority and the Independent Science Review Panel being established by the Northwest Power Planning Council.

The Memorandum of Agreement expires in 2001. The region will need to determine whether the agreement should be extended and what level of future funding should be established. An important issue in determining future funding needs is the rising repayment obligations as mainstem construction projects are completed. These obligations are expected to increase from \$73 million in Fiscal Year 1996 to \$153 million in Fiscal Year 2001.

This Multi-Year Implementation Plan primarily addresses activities funded by revenues from the Bonneville Power Administration. There are other activities funded by Congressional appropriations to restore fish and wildlife in the basin. Examples include the Mitchell Act hatcheries and habitat activities and the habitat restoration efforts of the U.S. Forest Service. These activities are not coordinated with Bonneville-funded programs. Coordination of all of these efforts would require new agreements to plan and prioritize available funds under common fiscal and biological goals.

The Bonneville budget agreement anticipates that Bonneville can use its own funds to replace lower-than-anticipated Congressional appropriations for mainstem construction projects. There is Congressional authority for direct funding of these projects, but the authority has only been used in limited circumstances. This section raises a number of issues that would have to be addressed before direct funding could be provided. The section also describes the issues that would have to be resolved if activities that are currently reimbursed by Bonneville (such as the Lower Snake River Compensation Plan or the operation and maintenance of Corps of Engineers facilities) were to be funded directly by Bonneville.

The Memorandum of Agreement anticipates that the budget prioritization process will address all categories of Bonneville's fish and wildlife expenditures. The planning for these activities takes place on different schedules. The annual workplan for activities that are directly funded by Bonneville is developed immediately before the beginning of the Fiscal Year. The regional planning for Congressionally appropriated funds occurs at least a year before so it can be submitted as part of the Administration budget.

The Memorandum of Agreement committed the federal agencies to share regionally developed budgets and to incorporate these schedules. If coordination is to improve for Fiscal Years 1998 and 1999, a process must be developed as soon as possible.

1.4 Next Steps to Accelerate the Implementation of Restoration Efforts

1.4.1 Integrate the Work of the Independent Scientific Group

In 1994 the Northwest Power Planning Council called for an independent scientific group to conduct a biennial review of the science underlying salmon and steelhead recovery efforts and Columbia River Basin ecosystem health. The Council's objective was to provide clear and authoritative analysis by impartial experts.

In September 1996, the Independent Scientific Group (ISG), now called the Independent Scientific Advisory Board (ISAB), delivered a report to the Council that provides a proposed conceptual foundation for the Council's Fish and Wildlife Program--a different foundation than the one underlying previous program activities. The ISG report, *Return to the River*, states:

Management of the Columbia River and its salmonid populations has been based on the [implicit] belief that the natural ecological processes that characterize a healthy salmonid production system to a large degree can be circumvented, or the natural production process simplified and controlled by humans, while maintaining or even enhancing production...The Independent Scientific Group concluded that these assumptions...drive management toward solutions which attempt to use technologies as substitutes for ecosystem functions.

The scientists go on to say that the measures derived from these assumptions clearly have failed to meet the goal of recovery of salmonids throughout the Columbia River, and that a new conceptual foundation is needed. They recommend treating the Columbia River and its tributaries as both a natural and a cultural system. A natural-cultural ecosystem encompasses all the ecological and social processes that link organisms, including humans, with their environments. This approach would attempt to integrate the habitat of salmon, resident fish, and wildlife with human habitat and other cultural developments.

In the report, the ISG recommends that fish and wildlife restoration should be based on the concept of a "normative ecosystem," and should try to recreate as much as possible the ecological conditions that sustained salmon before the river basin was developed. The panel recognizes that human development of the basin has occurred and will continue, and believes that this development can coexist with healthy and diverse salmon populations if enhancement efforts are made with the entire ecosystem in mind.

Three critical elements were identified as part of an ecologically based conceptual foundation against which restoration actions can be measured and evaluated. All three emphasize a watershed approach to the fish and wildlife mitigation in the Basin.

- 1) Restoration must address the entire natural and cultural ecosystem, which encompasses the continuum of habitats where species complete their life histories. This consideration includes human development as well as natural habitat.
- 2) Sustained productivity requires a network of complex and interconnected habitats that are created, altered, and maintained by natural physical processes in freshwater, the estuary, and the ocean. These diverse and high-quality habitats are crucial for spawning, rearing, migration, maintenance of food webs, and predator avoidance.
The ISG recommends that a priority be placed on high-quality habitat for production - for example, protecting the Hanford Reach for fall chinook. This recommendation is similar to the fish and wildlife managers' emphasis on protecting high-quality habitat at the watershed level.
- 3) Life history diversity, genetic diversity, and metapopulation organization are ways salmon and other fish and wildlife adapt to their complex and connected habitats. (metapopulations are "groups of local populations that are linked by individuals that stray among the populations.") This biodiversity and its organization contribute to the ability to cope with the environmental variation that is typical of freshwater and saltwater environments.

The members of the Columbia Basin Fish and Wildlife Authority agree with these basic tenets and have incorporated them into their conceptual framework.

The ISG emphasizes that the availability of complex and connected habitats is a critical contributor to salmon productivity. Also important are the metapopulations that maintain themselves by a high degree of homing to natal streams and a variable level of straying. Straying provides the dispersal of genetic traits needed to successfully recolonize habitat vacated by lost populations. These factors are also important for resident fish and wildlife.

1.4.2 Develop a Framework Based on the Conceptual Foundation in the ISG Report

The ISG report was completed too late to fully integrate its results into this first Multi-Year Implementation Plan. The conceptual framework in Section 5 begins the effort to incorporate the conceptual foundation of the ISG report.

Fish and wildlife managers will work with the ISAB, and the Council to refine the conceptual framework based on the conceptual foundation and scientific findings of the ISG report. The managers will also develop unified goals, objectives and strategies that are linked to the framework. The new framework should be completed in the spring of 1997.

1.4.3 Develop a Revised Multi-Year Implementation Plan

The fish and wildlife managers will use the new framework to develop a revised Multi-Year Implementation Plan. The framework should help resolve many of the issues identified in this document and lead to more agreement on the work that needs to be done over the next five years.

It may be appropriate to explore dispute resolution mechanisms to address some of the issues that need to be resolved in the near term so that key activities can stay on schedule.

1.4.4 Develop Comprehensive Recommendations for Amendments to the Columbia Basin Fish and Wildlife Program

The fish and wildlife managers will use the new framework and the revised Multi-Year Implementation Plan to develop comprehensive recommendations for the amendments to the Council's Columbia River Basin Fish and Wildlife Program.

The Council has announced its intention to seek recommendations from fish and wildlife managers and others for amendments to the fish and wildlife program. Recommendations are due _____. The Council will use these recommendations to modify its program. The Northwest Power Act provides one year for the Council to complete its amendment process.

1.4.5 Work with NMFS on a Final Recovery Plan

The framework and revised Multi-Year Implementation Plan will also be useful to the National Marine Fisheries Service as it prepares a final Recovery Plan for Snake River salmon. NMFS is interested in integrating its work into an ecosystem approach that makes future listings under the Endangered Species Act unnecessary.

1.4.6 Implement the Provisions of the Memorandum of Agreement

In addition to the coordinated implementation efforts described above, the MOA commits the parties to improve consultation with the Northwest Indian tribes. It also identifies specific activities to increase accountability, including improved budget accounting. The MOA also outlines a public information and involvement process.

The parties to the agreement are working on a detailed schedule to implement these provisions of the MOA. This section will include more details when they are available.

1.5 Summary of Costs

This section will summarize the costs identified in the sections of the Multi-Year Implementation Plan.

1.6 Scientific and Public Review of the Multi-Year Implementation Plan

This document will be reviewed by CBFWA members, the Council and federal agencies that implement these measures. CBFWA will also consult with interested parties.

This section will describe the opportunities for review of the document.