

**SECTION 7 CONSULTATION, SUFFICIENT PROGRESS,
AND HISTORIC PROJECTS AGREEMENT**

AND

RECOVERY ACTION PLAN (RIPRAP)

**RECOVERY IMPLEMENTATION PROGRAM
FOR ENDANGERED FISH SPECIES
IN THE UPPER COLORADO RIVER BASIN**

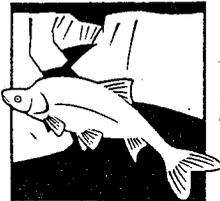


**United States Department of the Interior
Fish and Wildlife Service
Region 6, Denver, Colorado**



**REVISED
MARCH 11, 1996**

John Hamill
Director,
Recovery Program



RECOVERY PROGRAM FOR THE ENDANGERED FISHES OF THE UPPER COLORADO

Ralph Morgenweck
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CO/KS/NE/UT-CR/FY 96 - RIPRAP
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APR 29 1996

Memorandum

To: Implementation Committee and Interested Parties
Management Committee, Consultants and Interested Parties
Biology Committee, Consultants and Interested Parties
Water Acquisition Committee, Consultants and Interested Parties
Information and Education Committee, Consultants and Interested Parties
Recovery Program Interest Groups
Researchers

From: Director, Colorado River Recovery Implementation Program

Subject: Revised Section 7 Consultation, Sufficient Progress, and Historic Projects Agreement and Recovery Action Plan

I am pleased to distribute the revised Section 7 Agreement and Recovery Action Plan (RIPRAP).

If you have comments on this document, please submit them to me or a Management Committee representative. I will maintain an open file for RIPRAP comments in my office. The Recovery Program will address comments and revise the RIPRAP annually, with the next revision process beginning in January 1997.

A handwritten signature in black ink, appearing to read "John Hamill".

Attachment

PREFACE

This document was originally finalized on October 15, 1993. Part One remains unchanged. Part Two has been revised to accommodate annual updates as well as the designation of critical habitat for the endangered fishes.

PART ONE: Section 7 Consultation, Sufficient Progress, and Historic Projects Agreement

Sections 4.1.5, 4.1.6, and 5.3.4 of the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) outline procedures for consultation pursuant to Section 7 of the Endangered Species Act on water projects in the Upper Colorado River. The Section 7 Consultation, Sufficient Progress, and Historic Projects Agreement (Section 7 Agreement), was developed by Recovery Program participants to clarify how Section 7 consultations will be conducted on water depletion impacts related to new projects and impacts associated with historic projects (existing projects requiring a new Federal action) in the Upper Basin.

PART TWO: Recovery Implementation Program Recovery Action Plan

The Recovery Implementation Program Recovery Action Plan (RIPRAP) was developed by the Recovery Program participants in support of the Section 7 Agreement using the best information available and the recovery goals established for the four endangered fish species. It identifies specific actions and time frames currently believed to be required to recover the endangered fishes in the most expeditious manner in the Upper Basin. The RIPRAP will serve as a measure of accomplishment so that the Recovery Program can continue to serve as the reasonable and prudent alternative to avoid the likelihood of jeopardy to the continued existence of the endangered fishes for projects undergoing Section 7 consultation as well as to avoid the likely destruction or adverse modification of critical habitat.

PART ONE:

**RECOVERY IMPLEMENTATION PROGRAM
SECTION 7 CONSULTATION, SUFFICIENT PROGRESS,
AND HISTORIC PROJECTS AGREEMENT**

Agreement

Section 7 Consultation, Sufficient Progress, and Historic Projects

Recovery Implementation Program for the Endangered Fish Species in the Upper Colorado River Basin

October 15, 1993

I. Background

The Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (RIP) is intended to go considerably beyond offsetting water depletion impacts by providing for the full recovery of the four endangered fishes. The RIP participants recognize that timely progress toward recovery in accordance with a well-defined action plan is essential to the purposes of the RIP, including both the recovery of the endangered fishes and providing for water development to proceed in compliance with State law, Interstate Compacts, and the Endangered Species Act (ESA). Recovery activities which result in significant protection and improvement of the endangered fish populations and their habitat need to receive high priority in future planning, budgeting, and decision making. The RIP participants accept that certain positive population responses to RIP initiatives are not likely to be measurable for many years due to the time required for the endangered fishes to reach reproductive maturity, limited knowledge about their life history and habitat requirements, sampling difficulties and limitations, and other factors. The RIP participants also recognize that further degradation of endangered fish habitats and populations will make recovery increasingly difficult.

II. RIP Recovery Action Plan (RIPRAP)

The Recovery Action Plan (RIPRAP) identifies actions currently believed to be required to recover the endangered fishes in the most expeditious manner possible in the upper basin. It has been developed using the best information available and the recovery goals established for the four endangered fish species. By reference, the RIPRAP is incorporated and considered part of this agreement. The RIPRAP will be an adaptive management plan because additional information, changing priorities, and the development of the States' entitlement may require modifications to the RIPRAP. The RIPRAP will be reviewed annually and modified or updated, if necessary, by September 30 of each year or prior to adoption of the annual work plan, whichever comes first. The RIPRAP will serve as a guide for all future planning, research, and recovery efforts, including the annual work-planning and budget decision process.

The RIP is intended to provide the reasonable and prudent alternatives for projects undergoing Section 7 consultation in the upper basin. While some recovery actions in the RIPRAP are expected to have more direct or immediate benefits for the endangered fishes than others, all are considered necessary to accomplish the objectives of the RIP. Recovery

actions which protect or improve habitat conditions and result in more immediate, positive population responses will be most important in determining the extent to which the RIP provides the reasonable and prudent alternatives for projects undergoing Section 7 consultation. In general, these actions will be given highest priority in the RIPRAP.

The Fish and Wildlife Service (FWS) will determine whether progress by the RIP provides a reasonable and prudent alternative based on the following factors:

- a. Actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction.
- b. Status of fish population.
- c. Adequacy of flows.
- d. Magnitude of the impact of projects.

Therefore, these factors were considered in the development and prioritization of the recovery actions in the RIPRAP.

III. Framework for Agreement

The following describes the agreement among RIP participants on a framework for conducting Section 7 consultations on depletion impacts related to new projects (as defined in Section 4.1.5 a. of the RIP) and impacts¹ associated with historic projects in the Upper Colorado River Basin. This agreement is meant to supplement and clarify the process outlined in Sections 4.1.5, 4.1.6 and 5.3.4 of the RIP. This agreement applies only to the four Colorado River endangered fishes in the Upper Colorado River Basin, excluding the San Juan River, and is not a precedent for other endangered species or locations.

1. Activities and accomplishments under the RIP are intended to provide the reasonable and prudent alternatives which avoid the likelihood of jeopardy to the continued existence of the endangered Colorado River fishes (hereinafter the "reasonable and prudent alternative") resulting from depletion impacts of new projects and all existing or past impacts related to historic projects with the exception of the discharge by historic projects of pollutants such as trace elements, heavy metals, and pesticides.

The RIP participants intend the RIP also to provide the reasonable and prudent alternatives which avoid the likely destruction or adverse modification of critical habitat, to the same extent as it does to avoid the likelihood of jeopardy. Once critical habitat for the endangered fishes is formally designated, the RIP participants

¹ All impacts except the discharge of pollutants such as trace elements, heavy metals, and pesticides.

will make any necessary amendments to the RIPRAP to fulfill such intent.

2. The RIP is intended to offset both the direct and depletion impacts of historic projects occurring prior to January 22, 1988 (the date when the Cooperative Agreement for the RIP was executed) if such offsets are needed to recover the fishes. Under certain circumstances, historic projects may be subject to consultation under Section 7 of the ESA. An increase in depletions from a historic project occurring after January 22, 1988, will be subject to the depletion charge. Except for the circumstances described in item 11 below, depletion charges or other measures will not be required from historic projects which undergo Section 7 consultation in the future.
3. The Bureau of Reclamation (BR) and the Western Area Power Administration will operate projects authorized and funded pursuant to Federal reclamation law consistent with its responsibilities under Section 7 of the ESA and with any existing contracts. No depletion charge will be required on depletions from BR projects as long as BR continues its contributions to the RIP's annual budget.
4. The FWS will assess the impacts of projects that require Section 7 consultation and determine if progress toward recovery has been sufficient for the RIP to serve as a reasonable and prudent alternative. The FWS will use accomplishments under the RIP as its measure of sufficient progress. The FWS will also consider whether the probable success of the RIP is compromised as a result of a specific depletion or the cumulative effect of depletions. Support activities (funding, research, information and education, etc.) in the RIP contribute to sufficient progress to the extent that they help achieve a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction. Generally, sufficient progress will be evaluated separately for the Colorado and Green River subbasins (but not individual tributaries within each subbasin). However, the FWS will give due consideration to progress throughout the upper basin in evaluating sufficient progress.
5. If sufficient progress is being achieved, biological opinions will identify the activities and accomplishments of the RIP that support it serving as a reasonable and prudent alternative.
6. If sufficient progress is not being achieved, biological opinions for new and historic projects will be written to identify which action(s) in the RIPRAP must be completed to avoid jeopardy. Specific recovery actions will be implemented according to the schedule identified in the RIPRAP. The FWS will confer with the Management Committee on the identification of these actions within established timeframes for the Section 7 consultation. For historic projects, these actions will serve as the reasonable and prudent

alternative as long as they are completed according to the schedule identified in the RIPRAP. For new projects, these actions will serve as a reasonable and prudent alternative so long as they are completed before the impact of the project occurs. The FWS has ultimate authority and responsibility for determining whether progress is sufficient to enable it to rely upon the RIP as a reasonable and prudent alternative and identifying actions necessary to avoid jeopardy.

7. Certain situations may result in the FWS determining that the recovery action in previously rendered biological opinions are no longer serving as a reasonable and prudent alternative. These situations may include, but are not limited, to:
 - a. Critical deadlines for specified recovery actions are missed;
 - b. Specified recovery actions are determined to be infeasible; and
 - c. Significant new information about the needs or population status of the fishes becomes available;
8. The FWS will notify the Implementation and Management Committees when a situation may result in the RIP not serving as a reasonable and prudent alternative. The Management Committee will work with the FWS to evaluate the situation and develop the most appropriate response to restore the RIP as a reasonable and prudent alternative (such as adjusting a recovery action so it can be achieved, developing a supplemental recovery action, shortening the timeframe on other recovery actions, etc.).
9. The RIP is responsible for providing flows which the FWS determines are essential to recovery of the endangered fishes. Whether or not a Section 7 review is required, the RIP will work cooperatively with the owners/operators of historic projects on a voluntary basis to implement recovery actions needed to recover the endangered fishes.
10. The responsibility for the efficiency and effectiveness of the RIP, and for its viability as a reasonable and prudent alternative, rests upon RIP participants, not with individual project proponents. RIP participants fully share that responsibility.
11. If the RIP cannot be restored to provide the reasonable and prudent alternative per item 8, above, as a last resort the FWS will develop a reasonable and prudent alternative, if available, with the lead Federal Agency and the project proponent. (RIP participants recognize that such actions would be inconsistent with the intended operation of the RIP). The option of requesting a depletion charge on historic projects or other measures on new or historic projects will only be used in the event that the RIPRAP does not or can not be amended to serve as a reasonable and prudent alternative. In this situation, the reasonable and prudent alternative will be consistent with the intended purpose of the action, within the

Federal Agency's legal authority and jurisdiction to implement, and will be economically and technologically feasible.

12. This agreement becomes effective upon adoption of the RIPRAP by the Implementation Committee. Until the RIPRAP is adopted, the FWS will use the procedures in this agreement and the January 1993, draft RIPRAP as the basis for identifying reasonable and prudent alternatives.
13. Experience may dictate a need to modify this agreement in the future. This agreement may be modified or amended by consensus of all the RIP participants. A review of the agreement may be initiated by any voting member of the Implementation Committee.

PART TWO:

RECOVERY IMPLEMENTATION PROGRAM
RECOVERY ACTION PLAN
(RIPRAP)

**RECOVERY IMPLEMENTATION PROGRAM
RECOVERY ACTION PLAN
(RIPRAP)**

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1.0 INTRODUCTION

1.1 RECOVERY PROGRAM PURPOSE

The purpose of the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin (Recovery Program) is to recover the endangered fishes while providing for existing and new water development to proceed in the Upper Basin (Cooperative Agreement, 1988) in compliance with the Endangered Species Act. Further, the Recovery Program is intended to serve as a reasonable and prudent alternative to avoid the likelihood of jeopardy to the continued existence of the endangered fishes and to avoid the likely destruction or adverse modification of critical habitat in Section 7 consultations on depletion impacts related to new projects and all impacts (except the discharge of pollutants such as trace elements, heavy metals, and pesticides) associated with historic water projects in the Upper Basin.

1.2 SPECIES RECOVERY GOALS

The overall goal for recovery of the endangered fishes is to achieve naturally self-sustaining populations and to protect the habitat on which they depend. Attainment of this goal will result in recovery and delisting of the of the four species: Colorado squawfish (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*). The goal of the Recovery Program is recovery and delisting of the four endangered fishes in the upper basin.

The Service has developed recovery goals for each species, which are described in the Service's recovery plans (the razorback sucker plan is still in development). These recovery plans, developed under Section 4(f) of the Endangered Species Act, provide a biological and research-oriented approach to species recovery and include a recommendation for detailed management and site-specific implementation plans. Since the recovery plans refer to species recovery in both the upper and lower basins, their recovery goals apply to both basins. The Recovery Program provides for the coordinated implementation of these recovery plans in the Upper Basin.

As described in the recovery plans, the primary recovery goals for the Colorado squawfish and humpback chub are to establish and maintain natural self-sustaining populations and their habitat. Because of the critical population status of the bonytail in the upper basin, the immediate goal for this species is to prevent its extinction. The first recovery priority for the razorback sucker is to prevent their extinction in the wild, since there has been limited evidence of successful recruitment of young fish into the populations.

1.3 RECOVERY ACTION PLAN PURPOSE

This Recovery Implementation Program Recovery Action Plan (RIPRAP) has been developed using the best information available and the recovery goals established for the four endangered fish species. The RIPRAP is intended to provide an operational plan for implementing the Recovery Program, including development of the Program's annual work plan and future budget

needs. Specifically, the RIPRAP identifies the feasible actions which are necessary to recover the endangered fishes, including schedules and budgets for implementing those actions. The RIPRAP also identifies the specific recovery actions which must be accomplished in order for the Recovery Program to serve as the reasonable and prudent alternative to jeopardy to the continued existence of the endangered fishes and to avoid the likely destruction or adverse modification of critical habitat in Section 7 consultations for depletion impacts of new projects and all existing or past impacts related to historic water projects (except impacts from contaminants) in the Upper Basin, in accordance with the October 15, 1993 Section 7 Agreement. The RIPRAP was developed in support of that Agreement.

1.4 ESTIMATED COST OF RECOVERY ACTIONS

The estimated total budget for the Recovery Program from FY 1996 - FY 2003 is approximately \$104 million (see Section 5.0 on page 51). This total includes several large capital projects whose scope is not yet fully known (as noted in the "budget comments and qualifiers" column in the table in Section 5.0). Existing approved work plans total about \$61 million, however, some of those work plans do not yet fully describe all of the costs expected to be incurred during the FY 1998 - FY 2003 time period. Outyear funding costs will be modified to more accurately reflect expected costs as the work plans are updated annually. Funding for the Recovery Program is expected to come from the following sources:

- a. An annual operating budget of approximately \$3 million (adjusted annually for inflation, thus totaling approximately \$30 million through FY 2003) will be contributed by the U.S. Bureau of Reclamation (including hydropower revenues); the U.S. Fish and Wildlife Service; and the States of Colorado, Utah, and Wyoming. Additional annual funding will come from water development depletion fees, which could provide \$1 million through the year 2003. Under the Recovery Program, proponents of new water projects which undergo Section 7 Endangered Species Act consultation have agreed to pay a one-time depletion fee based on a project's average annual depletion. The rate is adjusted annually for inflation and as of October 1, 1995, it is \$13.04 per acre foot. The actual rate of water development has not been projected.

Annual operation and maintenance for refugia and hatchery facilities and fish passage facilities considered in Section 5.0 is expected to cost approximately \$9.6million through FY 2003.

- b. Approximately \$64 million will be needed through FY 2003 if the full scope of the projects considered in Section 5.0 is needed for recovery. Of this \$64 million, approximately \$29million will be used to acquire water and water rights to implement and maintain adequate instream flows for the fish, and approximately \$35million will be used for capital construction projects such as building fishways, hatcheries, and/or restoring flooded bottomlands. These are approximate costs; uncertainties remain regarding the scope of several projects and the degree to which other project beneficiaries will be expected to share in the costs. The Recovery Program is currently evaluating options for securing this funding.

1.5 MEASURING PROGRESS TOWARD RECOVERY AND SCHEDULING RIPRAP ACTIVITIES

To achieve recovery in the upper basin, it will be essential to fully implement all of the actions in the RIPRAP; this will be accomplished only through cooperation by all Program participants. In general, actions will be scheduled such that recovery will be achieved in the most expeditious and cost-effective manner possible. However, decisions associated with ongoing Section 7 consultation may require some adjustment in the schedule to insure that both goals of the Recovery Program are met.

Recovery actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction have been determined by the Service to be most important in determining the extent to which the Recovery Program provides the reasonable and prudent alternatives to jeopardy for projects undergoing Section 7 consultation. These actions are identified by the carat ">" in the Action Plans. Actions which the Service believes will contribute to the RIPRAP serving as a reasonable and prudent alternative to adverse modification of critical habitat are identified by an asterisk (*). These carated and asterisked actions will generally be given highest priority.

The Recovery Program will need to continually evaluate the outcome of completed RIPRAP actions to determine their effectiveness in helping to achieve recovery. Ultimately, success of recovery efforts will be measured by species response (change in population size, distribution, composition, etc.). However, it may be many years before such responses are evident. In the interim, the Recovery Program also will gage its progress towards recovery by accomplishment of the actions identified in the RIPRAP.

1.6 RECOVERY ACTION PLAN STRUCTURE

The substance of the RIPRAP is in Section 4.0, the Recovery Action Plans. It is here that the specific recovery actions are listed. The first Recovery Action Plan identifies general recovery program support activities important to the success of the Recovery Program. The following two Recovery Action Plans for the Green and Colorado rivers and their subbasins in the upper basin. Each action plan is arranged by specific activities to be accomplished within the "recovery elements" listed below:

- I. Protect instream flows;
- II. Restore habitat;
- III. Reduce negative impacts of nonnative fishes and sportfish management activities;
- IV. Conserve genetic integrity and augment or restore populations;
- V. Monitor populations and habitat and conduct research to support recovery actions;
- VI. Increase public awareness and support for the endangered fishes and the Recovery Program (in the General Recovery Program Support Action Plan only); and
- VII. Provide program planning and support (in the General Recovery Program Support Action Plan only).

The Recovery Action Plans (Section 4.0) have been formatted as tables for ease of scheduling and tracking activities. A general discussion of activities under each recovery element and of recovery priorities in each subbasin is found in Section 2.0 and 3.0, respectively. Projected budgets are broken out in Section 5.0.

2.0 DISCUSSION OF RECOVERY ACTION PLAN ELEMENTS

The Recovery Action Plan tables (Section 4.0) contain only very brief descriptions of recovery actions planned in each subbasin. In this section, recovery activities are explained in more detail, as they apply basin wide.

2.1 I. PROTECT INSTREAM FLOWS

Recovery cannot be accomplished without protecting and managing sufficient habitat to support self-sustaining populations of the endangered fishes. Protecting instream flows is key to protecting the habitat of these fishes. The first step in instream flow protection is to identify the flow regimes needed by the fish. In the Recovery Program, determining flow needs is primarily the responsibility of the Fish and Wildlife Service (in cooperation with other participants). Factors considered in determining flow needs include: flow effects on reproduction and recruitment; flow effects on food supplies and nonnative fishes; and interrelationships between flow and other habitat parameters believed to be important for the fish, such as channel structure, sediment transport, substrate characteristics, vegetative encroachment, and water temperature. Flow recommendations (for all or certain seasons) have been or are being developed for most river reaches targeted for recovery in the upper basin. Flow recommendations often are made in stages, with initial flow recommendations based on the best available scientific information, historic conditions, and extrapolation from similar reaches. Recommendations then are refined following additional field research. Below Federal dams (i.e. Flaming Gorge and the Aspinall Units), test flows are being provided while research is conducted to determine more precise flow recommendations.

Colorado

State acceptance of flow recommendations is the next step in instream flow protection. In Colorado, acceptance of flow recommendations by the Colorado Water Conservation Board is based on a review of their scientific basis, on legal and physical availability of water, and on an assessment of Compact considerations. Acceptance can be made on two levels in Colorado: one level is legal protection without any special qualifications; the other is for legal protection expressly subject to modification by the State. These levels of state acceptance will control the specific flow amounts to be legally protected by a variety of mechanisms.

Breaking state acceptance of flow recommendations into these two levels enables the flows to be legally protected despite uncertainties about the scientific basis for the Service's recommendations and about water availability or Compact allocations. These uncertainties will be periodically reviewed and the amount of legal protection that is explicitly modifiable can be continued, reduced, or converted to less qualified protection. Also as a part of these periodic reviews, the Service can make additional recommendations for flow protection and the state can decide to protect additional flow amounts, with more or less qualifications about the subsequent modification of those amounts.

Flow protection mechanisms are organized in many Recovery Action Plans according to their initial or dominant attribute. If a change in the ownership of a water right (by purchase, lease,

etc.) is central to flow protection, then flow protection is placed under "Acquire." A change in water right ownership to protect flows will usually be accompanied by a legal proceeding to change the nature or use of the water right, but this proceeding is still considered to be part of the "acquisition" of flow protection. Except for acquisition of conditional water rights in Colorado, such water rights acquisition also will result in physical alteration of flow conditions and will not just protect existing conditions.

Where flow protection involves filing for a new water right, it is placed under "Appropriate." With this mechanism, the ownership of the water right is established in the first instance, rather than being conveyed to a subsequent owner. In Colorado, the appropriation of an instream water right can be dated back to the action of the Colorado Water Conservation Board to advance to final notice a recommendation for an appropriation, but the Conservation Board also must make a water court filing to confirm the appropriation and to avoid postponement of the appropriation's priority date. It may take three or more years from this filing to obtain a decree from the water court, depending on the nature of any litigation over the filing. In appropriation, the water right will have a relatively junior priority date, and only existing flow conditions can be protected.

Flows also may be protected through the physical alteration of flow conditions by reoperating a reservoir or other component of an existing or new water project. This kind of flow protection is placed under "Deliver" in the Recovery Action Plans and will usually involve both a change of water right ownership, including the lease of storage water, and a change in the legal nature of the water rights. (A management agreement between federal agencies also may be involved as in the case of the Aspinall Units, and compensation will be required where storage water is already under contract.)

Utah

Legal protection of flows in Utah will be achieved differently than in Colorado. Several approaches can be taken under Utah water law to protect instream flows, including: 1) acquiring existing water rights and filing change applications to provide for instream flow purposes; 2) withdrawing unappropriated waters by governor's proclamation; 3) approving presently filed and future applications subject to minimum flow levels; and 4) with proper compensation, preparing and executing contracts and subordinating diversions associated with approved and perfected rights. Although current Utah water law may not fully provide for all aspects of instream flow protection, Utah does believe they can provide an adequate level of protection.

After examining the available flow protection approaches, it appears the most common strategy will be to condition the approval of presently filed and new applications, making them subject to predetermined streamflow levels. To accomplish this, the State Engineer would add a condition of approval to water right applications (within the area) filed after the policy is adopted. The condition would state that whenever the flow of the Green River (or other stream) drops below the predetermined streamflow level, then diversions associated with water rights approved after such condition was imposed would be prohibited. Based on past legal challenges to the State's authority to impose conditions associated with new approvals, it

would appear that this is within the authority of the State Engineer. This approach will not specifically recognize an instream flow right; however, it will protect the flows from being diverted and used by subsequently approved water rights. This strategy of conditioning the approval of presently filed and new applications also could be combined with the others listed above and with appropriately contracted reservoir reoperations.

Implementing this approach will require that the State Engineer conduct public hearings to present the proposed streamflow levels to the public and water users. At the hearing, comments would be taken about the proposal and time would be allowed to submit written comments. After reviewing the information presented and any additional investigation deemed necessary, the State Engineer then would determine if such flow protection is in the public interest. If so, a policy would be developed requiring presently filed and new applications to be approved subject to accepted flow recommendations (currently summer and fall flows in the Green River). As flow recommendations are finalized and accepted (e.g. winter and spring flows in the Green River), the policy would be applied to address these flows.

2.2 II. RESTORE HABITAT

Important elements of habitat protection include restoring and managing in-channel habitat and historically flooded bottomland areas, restoring passage to historically-occupied river reaches, enhancing water temperatures, and reducing or eliminating the impacts of contaminants.

Historically, upper Colorado River basin floodplains were frequently inundated by spring runoff, but today much of the river is channelized by levees, dikes, rip-rap, and tamarisk. Fish access to these flooded bottomlands has been further reduced by decreased peak spring flows due to upstream impoundments. Numerous studies have suggested the importance of seasonal flooding to river productivity, and flooded bottomlands have been shown to contain large numbers of zooplankton and benthic organisms. When these habitats are available, razorback suckers use them extensively for feeding prior to and after spawning, and may also have spawned in such sites. Colorado squawfish also use these areas for feeding prior to migrating to spawning areas.

The Recovery Action Plans contain tasks to identify and restore important flooded bottomland habitats. During 1994, the Recovery Program completed an inventory of floodplain habitats for 870 miles of the Colorado, Green, Gunnison, Yampa, and White rivers. From the list of inventoried habitats, sites have been (and will continue to be) selected to visit and screen for restoration potential. Site restoration began in 1994 and will continue until at least 1999. Success will be measured by the response of the endangered fish populations.

The General Recovery Program Support Action Plan contains tasks to develop an issue paper on floodplain restoration and protection. This paper will identify legal, institutional, and political strategies to enhance and protect floodplain habitats for endangered fish and ameliorate the effects of levees, diking, rip-rap, gravel mining, and other forms of floodplain development. The issue paper will first identify what floodplain restoration and protection is needed for endangered fish, then determine how to accomplish that restoration and protection. The issue paper will evaluate responsibilities of the Recovery Program, Program

participants, and other agencies involved in floodplain development, regulation, and management, and their roles and responsibilities with respect to endangered species.

Passage barriers have fragmented endangered fish populations and their habitats, resulting in confinement of the fishes to 20 percent of their former range. Blockage of Colorado squawfish movement by dams and water-diversion structures has been suggested as an important cause of the decline of this species in the upper basin (Tyus 1984, USFWS 1991). Restoring access to historically-occupied habitats via fish passage ways has been identified in the Colorado Squawfish Recovery Plan as one of several means to aid in Colorado squawfish recovery (USFWS 1991).

The Recovery Action Plans contain tasks to assess and make recommendations for fish passage at various dams and diversion structures. The need for passage already has been determined at some sites and activities are under way to restore passage at the Redlands Diversion Dam on the Gunnison River, and several diversions on the mainstem Colorado River near Palisade, Colorado.

The Green River directly downstream of Flaming Gorge Dam formerly provided habitat for all four of the endangered fishes. However, after the dam was closed, these warmwater species disappeared in the reach between the dam and the confluence with the Yampa River. Cold water temperatures (resulting from release of cold reservoir water) are presumed to be unsuitable and may be the primary reason for the absence of the endangered fishes there. Modifying water temperature by releasing warm surface water or otherwise manipulating flows from Flaming Gorge Reservoir has been suggested as a strategy to restore this habitat. As such, the Mainstem Green River Action Plan contains a task to identify options to release warmer water and restore native fish habitat in this reach.

A number of potentially harmful contaminants (including selenium, petroleum derivatives, heavy metals, and uranium) and suspected contaminant "hot spots" have been identified in the upper basin. It is the intent of the Recovery Program to support and encourage the activities of entities outside the Recovery Program that are working to identify problem sites, evaluate contaminant impacts, and reduce or eliminate those impacts.

2.3 III. REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES

Fifty-two fish species occur in the upper basin, but only 13 of those are native species. Many of the nonnative fishes have been successful due to changes in the river system that favor their survival over that of native fishes. Competition with and predation from nonnative species (not including salmonids) is widely assumed to have played a role in the decline of the endangered fishes (Bestgen 1990). However, evidence of direct impacts of introduced species on native fishes is difficult to obtain (Schoenherr 1981) and often is masked by man-caused habitat alterations (Moyle 1976).

Recovery Program activities related to nonnative fishes initially focused on identifying impacts/interactions and developing nonnative fish stocking procedures. A draft nonnative fish

control strategy has been developed to identify and prioritize options for controlling or removing nonnative fishes from the river. In FY 96, emphasis will be shifting to the control activities it identifies.

The states and the Service also have developed interim procedures for stocking of nonnative fishes in the upper basin. The procedures are designed to reduce the impact of stocking of nonnative fishes on native fishes in the upper basin and clarify the role of the states, the Service, and others, in the review of stocking proposals. Recovery Program participants disagree over the efficacy of the Procedures. In 1996, the Service will evaluate pursuant to NEPA, a range of options for controlling stocking of nonnative fishes. A decision as to which option to pursue will be made in the summer of 1996.

2.4 IV. CONSERVE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS

Species recovery depends on protecting and managing species genetic resources. This is a complex activity that includes: determining the genetic stocks of the endangered fishes; protecting those stocks in refugia; planning, developing, and operating propagation facilities; propagating genetic stocks for research, information and education, and augmentation or restoration; and planning, implementing, and evaluating augmentation or restoration of genetic stocks in the wild. Stocking is only an interim tool in the Recovery Program since recovery, by definition, implies that the populations or stocks will be self-sustaining in the wild. The success of augmentation and restoration stocking is dependent on prior or concurrent implementation of other recovery actions such as flow protection, habitat restoration, and management of nonnative fishes. This dependency is reflected in the schedule of subbasin-specific actions in Section 4.0.

Conducting studies to confirm presumed genetic stocks is vital to genetics management of the endangered fishes. Once identified, stocks may be protected in refugia to guard against catastrophe or to develop broodstocks. Representatives of stocks thought to be in immediate danger of extinction are brought into refugia immediately, rather than waiting until they have been confirmed as unique stocks through genetic studies. Refugia populations of genetic stocks are developed using paired breeding matrices to maximize genetic variability and integrity.

Most of this work is included under the General Recovery Program Support Action Plan, because it applies basinwide. Subbasin-specific activities of augmenting or restoring genetic stocks are placed under the subbasin Action Plans. As additional needs for augmentation or restoration are clearly identified, plans will be developed, fish produced, river reaches restored and augmented with those fish, and the results monitored and evaluated.

Four basic documents are used to plan, implement, and coordinate genetics management and artificial propagation for the endangered fishes. These are the Genetics Management Guidelines, Genetics Management Plan, Annual Propagation Operations Plan, and Coordinated Hatchery Facility Plan. All four of these plans have been developed and will be revised/updated annually, as needed.

The Genetics Management Guidelines document provides the rationale, genetics concepts, and genetic risks to be considered in genetics management planning and implementation. For example, it indicates that a fish population is the fundamental unit of genetics management and that its definition and characterization, relative to other populations, are important. Genetic surveys are part of the identification and characterization process. Further, the prioritization and genetics management required for each population is determined by its relative population status, demographic trends, and genetics data derived from the surveys.

The Genetics Management Plan is the operational document. It tells the "what, who, when, where" of implementation. It identifies specific objectives, tasks, activities, and type of facilities necessary to accomplish Recovery Program goals, i.e., protect population genetic integrity or restore a self-sustaining population in nature. It is the action plan developed for implementation, directed by the Recovery Program goals, and structured along the format presented in the Genetics Management Planning Guidelines document.

Genetics management requires a great deal of operational activity. Refugia and propagation facilities must be planned, built, and operated in a coordinated fashion. For this reason, the General Recovery Program Support Action Plan contains a task to produce an annual Propagation Operational Plan. Based on the Genetics Management Plan, this annual Propagation Operational Plan provides specific annual guidance for propagation: numbers of adults and family lots needed from each population, number of fish needed in each family lot, and where these fish will be raised and maintained.

Additional facilities are required to meet short-term (within five years; experimental stocking) propagation needs, and plans are being formulated to meet long-term (five years or more; augmentation and restoration stocking) needs. The plan for these facilities is the Coordinated Hatchery Facility Plan. This Plan, in accordance with the Genetics Management Plan, defines facilities required to meet propagation needs, identifies fish needs that can be met by existing facilities, discusses the need for additional facilities, recommends expansion or modification of existing facilities or new constructions, and estimates costs for construction and operation of these facilities.

2.5 V. MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS

This category consists primarily of research and monitoring activities which have application to more than one of the foregoing elements. In the General Recovery Program Support Action Plan, this element includes: monitoring populations and habitat and annually assessing changes in habitat and population parameters; determining gaps in existing life history information (such as determining how the endangered fishes may imprint to their natal areas via chemoreception) and recommending and conducting research to fill those gaps; and improving scientific research and sampling techniques. Research activities are identified for each subbasin only to the extent that such activities are related to another recovery action in that subbasin. Such identification now, however, does not preclude further research in that subbasin that may be identified later or that is identified in the General Recovery Program Support Action Plan.

2.6 VI. INCREASE PUBLIC AWARENESS AND SUPPORT FOR THE ENDANGERED FISHES AND THE RECOVERY PROGRAM

Public information and education is crucial to the success of the Recovery Program. A multi-faceted information and education program is being implemented to: educate the public about the endangered fishes; increase public understanding and support regarding recovery of the fishes (including support at the local, state, and national levels); involve the public in implementation of Recovery Program activities; and promote communication and cooperation among members of the Recovery Program. All of the activities in this program are included under the General Recovery Program Support Action Plan.

Numerous site-specific activities such as news releases, public meetings, presentations, and publication distribution are being undertaken to promote understanding and support of Recovery Program actions and to involve the public in decisions which may impact specific locations in the Upper Basin.

The information and education program has developed or continues to develop a number of products, including a newsletter twice a year, news releases, information brochure, angler information card, signs in popular angler areas, educational video, educational slide show, a summary of historic information about the fishes, educational displays, river guide education programs, and a technical library.

2.7 VII. PROVIDE PROGRAM PLANNING AND SUPPORT

This work also is placed entirely under the General Recovery Program Support Action Plan. Recovery Program planning and support includes planning and tracking recovery activities, participation in Recovery Program committees, and managing, directing, and coordinating the overall Recovery Program. Another important program support activity involves securing the funding necessary to implement the Recovery Program.

3.0 DISCUSSION OF SUBBASIN RECOVERY PRIORITIES

Following is a summary of the importance of the various subbasins in the Upper Colorado River Basin to the endangered fishes and a brief discussion of the major actions directed at recovering the endangered fishes in these subbasins. A more detailed accounting of the activities, including funding requirements and schedules is found in Sections 4.0 and 5.0.

3.1 GREEN RIVER

3.1.1 Importance

The importance of the Green River to the endangered fishes has been established by the Recovery Program and recognized by many biologists. The Green River was listed as the highest priority area for recovery of Colorado squawfish in the Colorado Squawfish Recovery Plan (USFWS 1991). The Green River in Desolation and Gray canyons and in Dinosaur National Monument (Dinosaur) is considered important to the recovery of humpback chub in the Humpback Chub Recovery Plan (USFWS 1990a). The Bonytail Recovery Plan (USFWS 1990b) indicates that one of the last known riverine concentrations of bonytail was in the Green River within Dinosaur and identifies the Green River in Desolation/Gray Canyon and within Dinosaur as high priority recovery and/or restoration sites. In addition, the Green River supports the largest known population of razorback sucker in their natural riverine habitat (Lanigan and Tyus 1989).

3.1.2 Recovery Actions

Recovery actions in the Green River will focus on refining the operation of Flaming Gorge dam to enhance habitat conditions for the endangered fishes. A biological opinion was issued on the operation of Flaming Gorge Dam in 1991. This opinion contained flow recommendations for the Green River at Jensen, Utah for the months of July-October, and specified a range of experimental test flows for the remainder of the year. The effects of the test flows on the endangered fishes and their habitat are being evaluated through a variety of studies through 1997, at which time the biological opinion (including flow recommendations) will be reviewed and revised as appropriate.

Flow recommendations are also being developed for some tributaries to the Green River, such as the Yampa, White, and Duchesne rivers. Tributary and mainstem flow recommendations will be carefully coordinated to address recovery needs from a basin-wide perspective.

An element of the Flaming Gorge biological opinion identified the need to protect releases from Flaming Gorge from possible diversion in the occupied habitat of the endangered fishes. The initial focus of this effort was to legally protect Flaming Gorge releases in the Green River down to the confluence of the Duchesne River for the months of July through October. Flow protection for the remainder of the year (November - June) and downstream to Canyonlands National Park will be addressed following issuance of the revised biological opinion in 1997.

Other Green River activities will involve restoration of bottomlands adjacent to the Green River which flood in the spring and provide important habitat for razorback suckers and Colorado squawfish. Old Charlie Wash on the Ouray National Wildlife Refuge near Ouray, Utah has been restored and plans are underway to restore 5-10 additional areas along the Green River in 1996.

Refuge (captive) populations of razorback suckers collected from the Green River will be developed and maintained at the Endangered Fish Hatchery at Ouray, Utah. A plan for augmenting razorback suckers into the Green River using hatchery propagated fish was developed and is currently being implemented.

Contamination of water in Stewart Lake and Ashley Creek near Jensen, Utah with the heavy metal, selenium, has been identified as a source of impact to the razorback sucker. The Fish and Wildlife Service, the Environmental Protection Agency and the Bureau of Reclamation are actively pursuing clean-up activities in these areas independent of the Recovery Program.

3.2 YAMPA RIVER AND LITTLE SNAKE RIVER

3.2.1 Importance

The Yampa River, a tributary to the Green River, is essential for the maintenance and recovery of the endangered fishes in the Green River basin. The relatively unaltered flows of the Yampa River are responsible for providing a natural shape to the hydrograph of the Green River. Catch rates of adult and sub-adult Colorado squawfish which occupy the river year-round are high when compared with other areas of occupied habitat in the basin. The Yampa River contains one of two confirmed Colorado squawfish spawning areas in the Upper Basin and is a major producer of fish for the entire Green River basin (Tyus and Karp 1989). The Colorado Squawfish Recovery Plan (USFWS 1991) has identified the Yampa River as one of the essential habitat areas that must be protected before the Colorado squawfish can be considered eligible for delisting. A small but apparently self-sustaining population of humpback chub exists in the Yampa River in Dinosaur National Monument (Tyus and Karp 1989). The Humpback Chub Recovery Plan (USFWS 1990a) identified the Yampa River in Dinosaur as one of the primary recovery areas for the humpback chub. Adult and larval razorback suckers have been captured in the mouth of the Yampa River. Adult razorback suckers have been captured upstream to the mouth of the Little Snake River (Tyus and Karp 1989). The lower portion of the Yampa River was part of the historic range of the bonytail and is associated with some of the most recent captures of this very rare fish. The Bonytail Recovery Plan (USFWS 1990b) identifies the Yampa River within Dinosaur as high priority recovery and/or restoration site for the bonytail.

The Little Snake River provides approximately 28 percent of the Yampa River's flow and 60 percent of the river's sediment supply. The sediment supply of the Little Snake is believed to be important to the maintenance of backwater nursery areas utilized by young Colorado squawfish in the Green River (Smith and Green 1991). Adult Colorado squawfish have been captured up the Little Snake River to near Baggs, Wyoming. Humpback chub have been captured in the lower 10 miles of the Little Snake River.

3.2.2 Recovery Actions

Recovery actions in the Yampa River are focused on maintaining and legally protecting the natural flow regime required to recover the endangered fishes. To achieve this objective, the Recovery Program is participating in the development of a Yampa River Operations and Management Plan. The purpose of the plan will be to provide and protect the instream flow needs of the endangered fishes while providing water to meet human needs in the Yampa River basin. In 1996-1998, the Service and Reclamation will develop an Environmental Impact Statement on the alternatives available for meeting those objectives. The potential enlargement of Elkhead Reservoir will be addressed as part of that NEPA process.

The Colorado Water Conservation Board filed for a junior instream flow water right for the Yampa River between the confluences of the Williams Fork and the Little Snake River in December 1995. Forty-eight statements of opposition were filed against these filings in State water court. There will likely be several years of negotiations and/or litigation to address these statements of opposition. The Board will file for a junior instream flow right for the Yampa River below the Little Snake River by December 1997.

The rehabilitation of several low-level agriculture water diversion dams on the Yampa River to provide for Colorado squawfish passage is being explored. A variety of existing diversions between Craig and Dinosaur National Monument were inventoried in 1994-5. Several diversions were identified as possible barriers to fish migration under certain conditions. However, due to uncertainties about whether these were in fact barriers to Colorado squawfish movement during the migration period, a study will be conducted to determine threshold flows for adult Colorado squawfish passage on the Yampa River between Craig and Dinosaur National Monument.

In studies on the Green River, researchers documented that young squawfish constituted 5% of the diet of northern pike, even though squawfish made up a much smaller portion of the available food base in the river. Researchers estimated that a single northern pike could consume 100 or more squawfish per year. Also, northern pike are known to prey on native roundtail chub and may also feed on humpback chubs in the Yampa River. The results of a study on northern pike in the Yampa River are still pending. The Recovery Program expects to begin removing northern pike from certain reaches of the Yampa River to more acceptable waters in 1998 (following acceptance of the nonnative fish control strategy and public involvement).

Studies also are planned to evaluate the importance of the Little Snake River. A detailed work plan is being drafted for the Little Snake River in 1996. Initial flow recommendations will be developed and opportunities for improving late summer-early fall base flows will be evaluated in 1998-99. Inflows from the Little Snake River in Colorado and Wyoming that are necessary to recover endangered fishes on the lower Little Snake and Yampa rivers will need to be legally protected.

3.3 DUCHESNE RIVER

3.3.1 Importance

Colorado squawfish and razorback suckers regularly utilize the mouth of the Duchesne River especially during spring runoff. Fishery surveys conducted in 1993 documented the use of the lower 15 miles of the Duchesne River by Colorado squawfish and razorback suckers.

3.3.2 Recovery Actions

Initial flow recommendations were developed for the Duchesne River in 1995 to address immediate concerns of several proposed water projects being considered in the Duchesne River basin. Water availability studies are now underway which should identify sources of water to meet the flow recommendations.

3.4 WHITE RIVER

3.4.1 Importance

Adult Colorado squawfish occupy the White River below Taylor Draw dam near Rangely, Colorado in relatively high numbers. Adult Colorado squawfish which reside in the White River spawn on the Green and Yampa Rivers. Juvenile and subadult Colorado squawfish also utilize the White River on a year-round basis. Incidental captures of razorback suckers have been recorded on the lower White River. Construction of Taylor Draw dam in 1984 blocked Colorado squawfish migration to the upper portions of the White River.

3.4.2 Recovery Actions

A work plan for the White River was developed to synthesize current information about the endangered fish and provide recommendations for specific recovery actions, including the merits of providing fish passage at Taylor Draw dam. Interim flow recommendations are scheduled to be developed for the White River by March 1997, and protection of those recommended flows by 1998.

3.5 COLORADO RIVER

3.5.1 Importance

The mainstem Colorado River from Rifle, Colorado to Lake Powell, Utah supports several very important populations of the endangered fishes. The recovery plans for the Colorado squawfish, humpback chub, and bonytail all recognize the Colorado River (or portions thereof) as being high priority recovery areas. A relatively large and healthy population of humpback chubs occurs at Black Rocks and Westwater Canyon near the Utah-Colorado state line. A smaller population of humpback chubs occurs in Cataract Canyon. All life stages of Colorado squawfish occur in the section of river from Palisade, Colorado downstream to Lake Powell. The upper reach of the Colorado River between Palisade and Rifle, Colorado is currently

unoccupied Colorado squawfish habitat, presumably the result of three diversion dams near Palisade which have blocked upstream migrations since the early 1900's. Razorback sucker populations in the mainstem Colorado River have declined precipitously in the past 20 years and only a few adult razorbacks have been captured from the river in the past 5 years. In 1993, 67 adult razorbacks were collected from isolated ponds adjacent to the Colorado River near Debeque, Colorado. There is no evidence of successful razorback reproduction in the Colorado River. A few (less than 10) suspected bonytail have been captured from the Colorado River in the Black Rocks area, near Moab, Utah and in Cataract Canyon over the past decade. However, this represents the highest catch rate of bonytails anywhere in the Upper Basin.

The 15-mile reach of the Colorado River immediately upstream of the confluence of the Gunnison River has been a focal point of recovery efforts to date. Catch rates of adult Colorado squawfish in the 15-mile reach are approximately double that of other areas in the Colorado River. In addition, concentrations of adult razorback suckers in spawning condition were found in the 15-mile reach prior to their precipitous decline over the past decade. Instream flows in the 15-mile reach have been heavily impacted as a result of several major agricultural water diversions during the late summer and early fall.

3.5.2 Recovery Actions

A variety of recovery actions are planned for the Colorado River. Numerous approaches are being taken to restore flows in the 15-mile reach to levels recommended by the Fish and Wildlife Service. The Bureau of Reclamation has been providing 20,000 acre feet of water from Ruedi Reservoir since 1990. When current Round II water sales from Ruedi Reservoir are completed, Reclamation and the State of Colorado have agreed to develop an agreement for about 15 years to use up the reservoir's remaining uncommitted water for endangered fish. The agreement will accommodate environmental commitments agreed to by Reclamation in the Environmental Impact Statement on Round II sales and any constraints of the reservoir's authorizing legislation. If flow recommendations for the 15-mile reach are met from other sources during the interim agreement, additional water from Ruedi beyond the original 10,000 acre-feet identified in the biological opinion on Ruedi and Green Mountain reservoirs would no longer be needed. At the end of the interim agreement, Reclamation may pursue additional water sales, regardless of whether the flow recommendations have been met. These sales would be subject to review under Section 7 of the Endangered Species Act. Concerns about repayment of Ruedi construction costs to Reclamation were raised during the initial discussions of the interim agreement. Specifically, Reclamation expects the project costs, now estimated at about \$18 million and expected to grow to \$36 million in the next 15 years, to be repaid. However, the State of Colorado is concerned that at the end of the interim contract the water may no longer be affordable to Western Slope users because of the high repayment costs. As a result of these issues, Reclamation, the Service, and the State of Colorado have agreed to enter into a one-year contract for up to an additional 21,650 acre-feet of water for 1996 and 1997. During this time, the parties will attempt to resolve the issues involving repayment of the project and to enter into a longer-term agreement for remaining Ruedi Reservoir water by December 1997.

In 1992, the Colorado Water Conservation Board filed an application in State water court for a 581 cfs instream flow right in the 15-mile reach for the months of July, August, and September. This filing has been under litigation since 1992 and will probably go to trial in 1996. The Board filed for junior instream flow water right for the 15-mile reach for the remainder of the year in December 1995. Ninety-five statements of opposition have been filed against this filing in State water court. Several years of negotiations and/or litigation will be required to address these statements of opposition. Flow protection for the Colorado River below the confluence of the Gunnison River will be addressed following completion of the Biological Opinion on the Aspinall Project in 1997.

Other promising sources of water for the 15-mile reach being explored include: (a) utilizing water saved by more efficiently managing water in the government-operated Grand Valley irrigation system and (b) changing the operation of the Collbran and Silt projects. In addition, Reclamation is evaluating opportunities to coordinate the operation of Federal and private projects (Colorado-Big Thompson Projects, Green Mountain, Ruedi, Williams Fork, etc.) in the headwater areas of the Colorado River to help meet the flow needs of the fish. This study also will provide background information for any needed Section 7 consultation on the Colorado Big-Thompson Project, Frying Pan-Arkansas Project, Colbran Project, Silt Project, and Grand Valley Diversion with respect to impacts to the fish and their critical habitat and measures that can be taken to offset those impacts.

The Bureau of Reclamation has initiated plans to provide for fish passage at the Grand Valley Irrigation Company Diversion Dam (Palisade), Price-Stubbs dam, and the Government Highline (Roller Dam) on the upper Colorado River. Successfully providing fish passage at these diversion dams would benefit both Colorado squawfish and razorback suckers by providing access to approximately 50 miles of the river that was used historically by these fish. Three floodplain sites on the Colorado River have been restored: a gravel pit at 29 5/8 Road in Grand Junction; a site at Walter Walker State Wildlife Area on the Colorado River downstream of Grand Junction; and an area near Adobe Creek downstream of Walter Walker.

Beginning in 1994, the Service experimentally stocked razorback suckers in the Colorado River near Rifle and Grand Junction, Colorado. Broodstock/refuge populations of Colorado squawfish, humpback chub, and razorback sucker have been developed from Colorado River stocks.

3.6 GUNNISON RIVER

3.6.1 Importance

The Gunnison River is currently occupied Colorado squawfish habitat and is historical habitat for the razorback sucker and bonytail chub. Several adult Colorado squawfish were captured in the Gunnison River in fishery surveys conducted in 1992 and 1993. Unrestricted migration of fish has been limited by the 10-foot high Redlands diversion located two miles above the mouth of the Gunnison River. Several larval Colorado squawfish have been collected in the Gunnison River immediately downstream of the Redlands diversion. Kidd (1977) reported that razorback suckers were collected frequently by commercial fishermen near Delta between

1930 and 1950. No razorbacks have been collected in the Gunnison River in recent times, although the reach near Delta, Colorado is considered a priority razorback restoration site.

3.6.2 Recovery Actions

Recovery activities on the Gunnison River are focused on constructing a fish ladder at the Redlands diversion dam, reoperating the Aspinall Unit to improve flow/habitat conditions in the Gunnison, and restoring flooded bottomland habitats near Delta, Colorado. Construction of the fish ladder at the Redlands diversion dam will be completed in 1996 and will provide for passage of both razorbacks and squawfish (as well as allowing exclusion of nonnative fishes).

A 5-year research plan to evaluate the effects of the Aspinall Unit on the endangered fishes and their habitat runs through 1997. During this research period, the Bureau of Reclamation and Western Area Power Administration are providing test flows. The research will culminate with a biological opinion on the operation of the Aspinall Unit in 1999. Legal protection of Aspinall releases and state protection of instream flows in the Gunnison River will be addressed following completion of the biological opinion on the Aspinall Unit.

Beginning in 1994, the Service experimentally stocked razorback suckers in the Gunnison River near Delta, Colorado.

3.7 DOLORES RIVER

3.7.1 Importance

The Dolores River is historical habitat of the Colorado squawfish; both adult and young-of-the-year fishes were captured in the 1950's and 1960's. Recent studies have only documented squawfish use in the lower mile of the river (Valdez et al., 1991). Uranium processing facilities operated during the late 1940's through the 1960's severely impacted the river and may have contributed to the decline of the Colorado squawfish in the Dolores drainage.

3.7.2 Recovery Actions

Recovery actions for the Dolores drainage have been limited to preventing escapement of nonnative sport fish (smallmouth bass, perch, kokanee salmon, etc.) from McPhee Reservoir. Environmental contaminant clean-up is being pursued by state and Federal agencies independent of the Recovery Program. Inflows from the Dolores River that are necessary to recover the endangered fishes on the mainstem of the Colorado River will need to be legally protected.

4.0 RECOVERY ACTION PLANS

The tasks in these Recovery Action Plans are prioritized by their schedules. Schedules are shown where they have been identified (if all the year columns for an activity are blank, then the activity has not yet been scheduled). If a completion date has been identified, it is shown under the appropriate fiscal year. Where specific dates have not been identified, but an action is ongoing, beginning, or ending in a year, an "X" appears in that year's column. The "who" column identifies the lead responsible agency (listed first) and any cooperating agencies. The status column is used where additional narrative is needed to explain the duration, status, etc. of an activity. Once again, the carat ">" identifies those recovery actions which are expected to result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction. An asterisk (*) identifies those activities which will contribute to the RIPRAP serving as a reasonable and prudent alternative to the likely destruction or adverse modification of critical habitat.

The Recovery Action Plans are formatted in a stepdown-outline tables. This is reflected in the numbering system and indenting. Some actions which assess options or the feasibility of a recovery action are followed by a subsequent implementation step, and others are not, depending on how feasible the implementation step is considered to be at this time.

The following abbreviations are used to identify lead/cooperating agencies:

| | |
|-------|--|
| BR | Bureau of Reclamation |
| CO | State of Colorado |
| CDA | Colorado Department of Agriculture |
| CDOP | Colorado Department of Parks |
| CDOW | Colorado Division of Wildlife |
| CRWCD | Colorado River Water Conservation District |
| CWCB | Colorado Water Conservation Board |
| FWS | Fish and Wildlife Service |
| -ES | Ecological Services |
| -FR | Fishery Resources |
| -RW | Refuges and Wildlife |
| -WR | Water Resources |
| LFL | Larval Fishes Laboratory |
| PD | Recovery Program Director |
| TBD | To be determined |
| UT | State of Utah |
| UDWR | Utah Division of Wildlife Resources |
| UTWR | Utah Division of Water Resources |
| WYGF | Wyoming Game and Fish Division |

▷ ▷ ▷ ▷ ▷ **GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN** ◁ ◁ ◁ ◁ ◁ ◁ 20

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----------|--|----------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| I. | PROVIDE AND PROTECT INSTREAM FLOWS HABITAT MANAGEMENT | | | | | | | | |
| I.A. | Evaluate methods for defining habitat-flow needs and select methods most appropriate to specific stream reaches. | | | | | | | | |
| I.A.1. | Review instream flow methodologies and assess the technical adequacy of current flow recommendations. | PD | Complete | | | | | | |
| I.A.2. | Develop recommendations for integrating geomorphology and food web studies into Recovery Program. | PD | Complete | | | | | | |
| I.B. | Develop and select methods for modifiable protection of instream flows in Colorado. | | | | | | | | |
| I.B.1. | Develop, evaluate and select, as appropriate, options for interim protection of instream flows until uncertainty concerning habitat needs and water availability can be resolved. | | | | | | | | |
| I.B.1.a. | Colorado Attorney General review. | CO | Complete | | | | | | |
| I.B.1.b. | CWCB approval/recommended action. | CWCB | Complete | | | | | | |
| I.B.1.c. | Adopt legislation or regulation, if necessary. (CWCB adopted the Statement of Policy and Procedure Regarding the Appropriation of Instream Flows for the Recovery of Endangered Fishes of the Upper Colorado River Basin on March 9, 1994.) | CWCB | Ongoing | X | X | X | X | X | X |
| I.B.2. | Evaluate options for allocating Colorado's compact entitlement among the five subbasins, the implications for water available to recover the endangered fishes, and implications of full protection of recovery flow recommendations on development of Colorado's compact entitlement. | CWCB | Complete | | | | | | |
| I.B.3. | Assess need for retirement of senior conditional water rights. | CWCB | | | | 1/98 | | | |
| I.C. | Develop an enforcement agreement between the Service and appropriate State agencies to protect instream flows acquired under the Recovery Program for the endangered fishes. | | | | | | | | |
| >* | I.C.1. Colorado. | FWS/CWCB | Complete | | | | | | |
| II. | RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE) | | | | | | | | |
| II.A. | Restore flooded bottomland habitats. | | | | | | | | |
| II.A.1. | Conduct inventory of flooded bottomland habitat for potential restoration. | FWS-FR | Complete | | | | | | |
| II.A.2. | Screen high-priority sites for potential restoration/acquisition. | PD | | X | X | | | | |
| II.A.3. | Conduct NEPA for floodplain restoration program. | BR | | X | X | X | X | X | X |
| II.B. | Support actions to reduce or eliminate contaminant impacts. ¹ | | | | | | | | |

¹ Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|--------------|--|----------------|---------------------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| III.B.1. | Implementation Committee approval of Interim Nonnative Fish Stocking Procedures. | PD | Complete | | | | | | |
| III.B.2. | Implement Interim Nonnative Fish Stocking Procedures | | | | | | | | |
| III.B.2.a. | Develop scope of work for evaluation of Interim Procedures. | PD | Complete | | | | | | |
| III.B.2.b. | Evaluate and revise Interim Procedures. | PD | Complete | | | | | | |
| III.B.3. | Finalize revised Nonnative Fish Stocking Procedures. | | | | | | | | |
| III.B.3.a. | Complete Biological Opinion/NEPA compliance. | FWS-ES/FR | | 6/96 | | | | | |
| III.B.3.b | Implementation Committee approval of revised Nonnative Fish Stocking Procedures | PD | Unless EIS required | 7/96 | | | | | |
| III.B.3.c. | State wildlife commissions approval, as necessary. | STATES | Unless EIS required | 9/96 | | | | | |
| III.B.3.d. | Execute memoranda of agreement between Service and States. | FWS/ STATES | Unless EIS required | | 10/96 | | | | |
| III.B.5. | Incorporate final Procedures into State aquaculture permitting process. | | | | | | | | |
| >* | Colorado. | CDA/CDOW | Start 11/96 | | X | X | | | |
| >* | Utah. | UDWR | | | X | | | | |
| >* | Wyoming | WYGF | | | X | | | | |
| III.B.6. | Explore options for tribal acceptance of Nonnative Fish Stocking Procedures. | FWS-FR | | | X | | | | |
| IV. | MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES) | | | | | | | | |
| IV.A. | Genetics Management. | | | | | | | | |
| IV.A.1. | Develop and approve Genetics Management Guidelines. | PD | Complete | | | | | | |
| IV.A.2. | Develop and implement Genetics Management Plan for all species and genetic stocks and update by December of each year. | PD | Ongoing | X | X | X | X | X | X |
| IV.A.3. | Conduct genetic stock identification studies (includes Gila taxonomy studies) and confirm presumptive genetic stocks based on all available information. | | | | | | | | |
| IV.A.3.a. | Razorback sucker. | BR | | 6/96 | | | | | |
| IV.A.3.b. | Bonytail and humpback chubs. | | | | | | | | |
| IV.A.3.b.(1) | Morphological and allozyme analyses. (Draft 4/95) | PD | | 6/96 | | | | | |
| IV.A.3.b.(2) | Mitochondrial DNA analysis. | BR | | X | X | | | | |
| IV.A.3.c. | Colorado squawfish. | PD | | 6/96 | | | | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|------------|--|-----|----------------------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| VI.A. | Conduct survey to measure public awareness of and attitudes toward endangered Colorado River fishes and the Recovery Program. | PD | Periodic | | | | X | | |
| VI.B. | Train Recovery Program managers and researchers in media relations. | PD | Complete | | | | | | |
| VI.C. | Plan and implement information and education and public involvement activities for all significant Recovery Program actions (e.g presentations, public meetings, public involvement training, etc.). | PD | Ongoing | X | X | X | X | X | X |
| VI.D. | Promote technical publication of study results. | PD | Ongoing | X | X | X | X | X | X |
| VI.E. | Produce, distribute, and evaluate information and education products (such as newsletter, brochures, etc); manage media relations, including contacting reporters, producing news releases, fact sheets, etc. | PD | Ongoing | X | X | X | X | X | X |
| VI.G. | Participate in development of educational exhibits about the Recovery Program and the endangered fish. | PD | | | X | | | | |
| VI.F. | Establish Recovery Program technical library and announce availability of research information clearinghouse; update annually. | PD | Ongoing | X | X | X | X | X | X |
| VII. | PROVIDE PROGRAM PLANNING AND SUPPORT (PROGRAM MANAGEMENT) | | | | | | | | |
| VII.A. | Determine actions required for recovery. | | | | | | | | |
| VII.A.1. | Update, refine, and prioritize recovery actions (RIPRAP) annually. | PD | Annual | X | X | X | X | X | X |
| VII.A.2. | Develop Interim Management Objectives (IMO's) for each species and presumptive stock and an index to population status. | PD | Update every 5 years | X | 5/97 | | | | |
| VII.A.2.a. | Implementation Committee review and approval of IMO's. | ALL | | | 9/97 | | | | |
| VII.A.2.b. | Service approval of IMO's. | FWS | | | | 12/97 | | | |
| VII.A.3. | Monitor and assess Recovery Program accomplishments annually. IMOs will be used to gauge biological response of target populations or stocks to specific recovery actions. | PD | Annual | X | X | X | X | X | X |
| VII.A.4. | Develop annual work plan to address priority needs. | PD | Annual | X | X | X | X | X | X |
| VII.B. | Actively participate in Recovery Program committees and secure funding for annual work plan and larger projects (e.g. water acquisition, capital construction, and long term operation and maintenance) in accordance with the recovery actions and milestones (Utah, Colorado, Wyoming, Bureau of Reclamation, Fish and Wildlife Service, Western Area Power Administration, Water Users Environmental Groups, Colorado River Energy Distributors Association). | PD | Ongoing | X | X | X | X | X | X |
| VII.C. | Manage, direct, and coordinate Recovery Program activities. | PD | Ongoing | X | X | X | X | X | X |
| VII.C.1. | Review Information and Education program (Management Committee). | PD | Complete | | | | | | |

▷▷▷▷▷ GREEN RIVER ACTION PLAN: MAINSTEM ◁◁◁◁◁◁

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|-------------|---|--------|---|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| I. | PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT) | | | | | | | | |
| I.A. | Green River above Duchesne River (Utah only; flows not threatened in Colorado because river is entirely within a National Wildlife Refuge and National Monument.) | | | | | | | | |
| I.A.1. | Initially identify year-round flows needed for recovery while providing experimental flows. | | | | | | | | |
| I.A.1.a. | Summer/fall. | FWS-ES | Complete | | | | | | |
| I.A.1.b. | Winter/spring. | FWS-ES | | X | 9/97 | | | | |
| I.A.1.c. | Review summer/fall flow recommendation. | FWS-ES | | X | 9/97 | | | | |
| I.A.2. | State acceptance of initial flow recommendations. | | | | | | | | |
| I.A.2.a. | Summer/Fall. | UT | Complete; may be revised based on new info. | | | | | | |
| I.A.2.b. | Winter/Spring. | | | | | | | | |
| I.A.2.b.(1) | Review scientific basis. | UT | | X | 12/97 | | | | |
| I.A.2.b.(2) | Assess legal and physical availability of water. | UT | | X | 12/97 | | | | |
| I.A.3. | Deliver identified flows. | | | | | | | | |
| >* | Operate Flaming Gorge pursuant to the Biological Opinion to provide summer and fall flows. | BR | Begin 93, ongoing | X | | X | X | X | X |
| >* | Operate Flaming Gorge to supply winter and spring test flows for research. | BR | Ongoing through 9/97 | X | | | | | |
| >* | Operate Flaming Gorge Dam to provide winter and spring flows and revised summer/fall flows, if necessary. | BR | Begin 10/97, ongoing | X | | X | X | X | X |
| I.A.4. | Legally protect identified flows. | | | | | | | | |
| I.A.4.a. | Protect Summer/Fall flows. | | | | | | | | |
| I.A.4.a.(1) | Hold public meeting to establish future appropriation policy. | UT | Complete 10/94 | | | | | | |
| I.A.4.a.(2) | Adopt and implement new policy (new appropriations subject to flow criteria). | UT | Complete 11/94 | | | | | | |
| >* | Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights. | UT | Ongoing | X | | X | X | X | X |
| I.A.4.a.(4) | Evaluate effectiveness of policy. | UT | | | | | X | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|--------------|--|-----------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| | Protect Winter/Spring flows. | | | | | | | | |
| I.A.4.b. | | | | | | | | | |
| I.A.4.b.(1) | Hold public meeting to establish future appropriation policy. | UT | | X | | X | | | |
| I.A.4.b.(2) | Adopt and implement new policy (new appropriations subject to flow criteria). | UT | | X | | X | | | |
| I.A.4.b.(3) | Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights. | UT | | | | X | | | |
| I.B. | <u>Green River below the Duchesne River</u> | | | | | | | | |
| I.B.1. | Initially identify year-round flows needed for recovery while providing experimental flows. | FWS-ES | | X | 9/97 | | | | |
| I.B.2. | State acceptance of initial flow recommendations (dependent on development of initial flow recommendations). | | | | | | | | |
| I.B.2.a. | Review scientific basis. | UT | | | X | 12/97 | | | |
| I.B.2.b. | Assess legal and physical availability of water from Green River and tributaries. | UT | | | X | 12/97 | | | |
| I.B.3. | Legally protect identified flows (dependent on development of initial flow recommendations). | | | | | | | | |
| I.B.3.a. | Hold public meeting to establish future appropriation policy. | UT | | | X | X | | | |
| I.B.3.b. | Adopt and implement new policy (new appropriations subject to flow criteria). | UT | | | X | X | | | |
| I.B.3.c. | Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights. | UT | | | | X | | | |
| I.C. | <u>Price River</u> | | | | | | | | |
| I.C.1. | Assess recovery potential. | UT | | X | | | | | |
| I.D. | <u>San Rafael River</u> | | | | | | | | |
| I.D.1. | Assess recovery potential. | TBD | | | | | 9/99 | X | |
| II. | RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE) | | | | | | | | |
| II.A. | Restore and manage flooded bottomland habitat. | | | | | | | | |
| II.A.1. | Conduct site restoration. | | | | | | | | |
| II.A.1.a. | Old Charlie Wash. | | | | | | | | |
| II.A.1.a.(1) | Construct water control structure and fish access. | BR | Complete | | | | | | |
| II.A.1.a.(2) | Update management plan. | PD | | X | | | | | |
| II.A.1.a.(3) | Monitor and evaluate success. | FWS-FR/BR | | X | | X | | X | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|--------------|--|-------------------|-----------------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| II.A.2. | Acquire interest in high-priority flooded bottomland habitats between Ouray NWR and Jensen to benefit endangered fish. | | | | | | | | |
| II.A.2.a. | Identify and evaluate sites. | FWS-FR | | X | 9/97 | | | | |
| II.A.2.b. | Pre-acquisition planning and identification of acquisition options. | PD | | X | | | | | |
| II.A.2.c. | Conduct appraisal/NEPA compliance. | PD | | X | X | | | | |
| >* II.A.2.d. | Negotiate acquisition and acquire. | PD | | X | X | | | | |
| II.A.2.e. | Evaluate effectiveness of land acquisition activities and provide recommendations. | PD | | | X | X | | | |
| II.A.3. | Implement levee removal strategy at high-priority sites. | | | | | | | | |
| II.A.3.a. | Preconstruction (contaminants screening, floodability assessments, environmental compliance, design, and engineering. | BR | | X | X | | | | |
| >* II.A.3.b. | Construction (levee breaching). | BR | | | X | X | | | |
| II.A.3.c. | Evaluation. | FWS | | X | X | X | | | |
| II.B. | Restore native fish passage at instream barriers. | | | | | | | | |
| II.B.1. | Assess and make recommendations for fish passage at low flows at Tusher Wash. | FWS-FR/ -WR/BR | | X | | | | | |
| II.B.2. | Evaluate and implement viable options to restore fish passage. | BR/FWS | | X | X | | | | |
| II.B.2.a. | Design passage, conduct NEPA compliance. | BR | | X | X | | | | |
| II.B.2.b. | Construct fish passage. | BR | | | 3/97 | | | | |
| >* II.B.3. | Operate and maintain fish passage. | TBD | Ongoing, beginning in FY 97 | | X | X | X | X | X |
| II.B.4. | Monitor and evaluate success. | FWS | | | X | X | | | |
| II.C. | Enhance water temperatures to benefit endangered fishes. | | | | | | | | |
| II.C.1. | Identify options to release warmer water from Flaming Gorge Reservoir to restore native fish habitat in the Green River. | BR | | X | | | | | |
| II.D. | Support actions to reduce or eliminate contaminant impacts at Ashley Creek and Stewart Drain. ¹ | FWS-ES | | X | X | X | X | X | X |
| III. | REDUCE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT) | | | | | | | | |

¹ Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|--------------|---|--------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| III.A. | Reduce negative impacts to endangered fishes from sportfish management activities. | | | | | | | | |
| III.A.1. | Determine relationship between Flaming Gorge test flows and relative abundance of young Colorado squawfish and nonnative fishes in nursery habitat. | UDWR | | 9/96 | | | | | |
| III.A.2. | Control escapement of nonnative fishes from Ouray National Wildlife Refuge originating from Pelican Lake. | FWS-RW | | 4/96 | | | | | |
| >* III.A.3. | Identify and control sources of centrarchids in the middle Green River. | UDWR | | | X | X | | | |
| IV. | MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES) | | | | | | | | |
| IV.A. | Augment or restore populations as needed. | | | | | | | | |
| IV.A.1. | Razorback sucker. | | | | | | | | |
| IV.A.1.a. | Develop augmentation plan. | FWS-FR | Complete | | | | | | |
| IV.A.1.b. | Seek Program acceptance of augmentation plan. | | Complete | | | | | | |
| >* IV.A.1.c. | Implement augmentation plan on middle Green River. (Goal is to stabilize the adult population at 1000 fish). | FWS | | X | X | X | X | | |
| >* IV.A.1.d. | Implement augmentation plan on lower Green River. | UDWR | | | | X | X | X | X |
| V. | MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT) | | | | | | | | |
| V.A. | Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions. | | | | | | | | |
| V.A.1. | Verify additional Colorado squawfish spawning areas in lower Green. | UT | | X | | | | | |
| V.A.2. | Identify additional razorback sucker spawning areas in lower Green. | UT | | X | | | | | |

▷ ▷ ▷ GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----------------|--|-------------------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| I. | PROVIDE AND PROTECT INSTREAM FLOWS HABITAT MANAGEMENT | | | | | | | | |
| I.A. | Yampa River above the Little Snake River | | | | | | | | |
| I.A.1. | Initially identify year-round flows needed for recovery. | FWS-FR | Complete | | | | | | |
| I.A.2. | Design and implement long-term monitoring program to evaluate status/trends in native and nonnative fishes, physical habitat, water quality, etc., in order to evaluate and refine year-round flows needed for recovery. | FWS-FR | | X | X | X | X | X | X |
| I.A.3. | State acceptance of initial flow recommendations (dependent on development of initial flow recommendation). | | | | | | | | |
| I.A.3.a. | Review scientific basis. | CWCB/ CDOW | Complete | | | | | | |
| I.A.3.b. | Assess legal and physical availability of water. | CWCB | Complete | | | | | | |
| I.A.3.c. | Assess compact considerations. | CWCB | Complete | | | | | | |
| I.A.3.d. | Preliminary notice of bi-level acceptance | CWCB | Complete | | | | | | |
| I.A.4. | Legally protect identified flows. | | | | | | | | |
| I.A.4.a. | Acquire. | | | | | | | | |
| I.A.4.a.(1) | Steamboat Lake. | | | | | | | | |
| I.A.4.a.(1)(a) | Change decree (litigation dependent). | CDOP | | 6/96 | | | | | |
| I.A.4.a.(1)(b) | Lease 2,000 af. to augment late summer flows. | FWS-WR | Ongoing | 7/96 | X | X | X | X | X |
| I.A.4.a.(2) | Juniper conditional decree(s). | | | | | | | | |
| I.A.4.a.(2)(a) | Complete Phase II Feasibility Study. | CRWCD/ CWCB/BR | Complete | | | | | | |
| I.A.4.a.(3) | Yampa River operation and management plan. | | | | | | | | |
| I.A.4.a.(3)(a) | Conduct NEPA compliance. | FWS/BR | | X | X | X | X | X | X |
| I.A.4.a.(3)(b) | Implement plan. | TBD | | | X | X | X | X | X |
| I.A.4.b. | Appropriate. | | | | | | | | |
| I.A.4.b.(1) | CWCB action to advance preliminary to final notice. | CWCB | Complete | | | | | | |
| I.A.4.b.(2) | CWCB filing. | CWCB | Complete | 12/95 | | | | | |
| I.A.4.b.(3) | Water court adjudication (litigation dependent) | CWCB | | | | | 12/98 | | |
| I.A.5. | Review initial recommendations and legal protection. | CWCB | Ongoing | | | | | | X |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|-------------|--|---------------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| I.B. | Yampa River below Little Snake River | | | | | | | | |
| I.B.1. | Initially identify year-round flows needed for recovery. | FWS-FR | Complete | | | | | | |
| I.B.1.a. | Modify based on revisions to environmental baseline. | FWS-WR | Complete | | | | | | |
| I.B.1.b. | Update flow recommendations to include flows from the Little Snake River. | FWS | | X | | | | | |
| I.B.2. | Design and implement long-term monitoring program to evaluate status/trends in native and nonnative fishes, physical habitat, water quality, etc., in order to evaluate and refine year-round flows needed for recovery. | FWS-FR | | X | X | X | X | | X |
| I.B.3. | State acceptance of initial flow recommendations. | | | | | | | | |
| I.B.3.a. | Review scientific basis. | CWCB/ CDOW | | | X | | | | |
| I.B.3.b. | Assess legal and physical availability of water. | CWCB | Complete | | | | | | |
| I.B.3.c. | Assess compact considerations. | CWCB | Complete | | | | | | |
| I.B.3.d. | Preliminary notice of bi-level acceptance. | CWCB | | | X | | | | |
| I.B.4. | Legally protect identified flows. | | | | | | | | |
| I.B.4.a. | Acquire. | | | | | | | | |
| I.B.4.a.(1) | Assess, acquire and convert water rights to instream flows. | CWCB | | | | | | | |
| I.B.4.a.(2) | (See upstream reaches.) | | | | | | | | |
| I.B.4.b. | Appropriate. | | | | | | | | |
| I.B.4.b.(1) | CWCB action to advance preliminary to final notice. | CWCB | | | X | | | | |
| I.B.4.c.(2) | CWCB filing. | CWCB | | | | 12/97 | | | |
| I.B.4.c.(3) | Water court adjudication (litigation dependent) | CWCB | | | | | | | 12/00 |
| I.B.5. | Review initial recommendations and legal protection. | CWCB | Ongoing | | | | | | |
| I.C. | Little Snake River (Colorado and Wyoming) | | | | | | | | |
| I.C.1 | Evaluate importance of Little Snake River to endangered fishes and develop management action plan. (Determine if habitat exists to protect under Colorado's instream flow program.) | BR/LFL | | X | | | | | |
| I.C.2. | Initially identify year-round flows needed for recovery (needed). | | | | | | | | |
| I.C.2.a. | Develop work plan. | BR/LFL | | | 12/96 | | | | |
| I.C.2.b. | Identify flows. | TBD | | | | X | X | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----------|--|-----------------|--------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| III.B.1. | Identify potential conflicts between present fisheries management in existing Elkhead Reservoir and endangered fishes and formulate alternative management plan. | CDOW | | 3/96 | | | | | |
| III.B.2. | Evaluate control options and implement measures to control nonnative fish escapement from existing Elkhead Reservoir. | FWS-FR/ CDOW | | X | 12/96 | | | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----------|---|--------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| I. | PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT) | | | | | | | | |
| I.A. | Identify initial year-round flows needed for recovery. | FWS-ES | Complete | | | | | | |
| I.A.1. | Conduct hydrology/water availability study. | UT | | 9/96 | | | | | |
| I.A.2. | Conduct follow-up study to evaluate and refine flow recommendations. | FWS-FR | | | | X | X | | X |
| I.B. | State acceptance of initial flow recommendations (dependent on development of initial flow recommendations). | | | | | | | | |
| I.B.1. | Review scientific basis. | UT | | | X | | | | |
| I.B.2. | Assess legal and physical availability of water. | UT | | | X | | | | |
| I.C. | Legally protect and deliver identified flows. | UT | | | | X | X | | X |
| II. | RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE) | | | | | | | | |
| II.A. | Support actions to reduce or eliminate contaminant impacts on the lower Duchesne. ¹ | FWS-ES | | X | X | X | | | |
| III. | REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT) | | | | | | | | |
| III.A. | Reduce negative interactions between nonnative and endangered fishes. | | | | | | | | |
| III.A.1. | Identify most damaging nonnative fishes. | UDWR | Complete | | | | | | |
| III.A.2. | Assess options to control negative interactions from nonnative fishes from the Duchesne River to benefit Colorado squawfish and razorback sucker young-of-the-year. | UDWR | Complete | | | | | | |
| >* | III.A.3. Implement and evaluate the effects of viable measures to control negative interactions from nonnative fishes. (See III.A.3. under Green River Mainstem Action Plan.) | UDWR | | X | X | X | | | |

¹ Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----------------|--|--------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| I. | PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT) | | | | | | | | |
| I.A. | Initially identify year-round flows needed for recovery. | | | | | | | | |
| I.A.1. | Develop work plan. | FWS-FR | Complete | | | | | | |
| I.A.2. | Identify flows. | FWS-FR | | X | 3/97 | | | | |
| I.B. | State acceptance of initial flow recommendations (dependent on development of initial flow recommendations). | | | | | | | | |
| I.B.1. | Review scientific basis, dependent on development of flow recommendations by FWS. | UT/CO | | | 6/97 | | | | |
| I.B.2. | Assess legal and physical availability of water. | UT/CO | Complete | | | | | | |
| I.B.3. | Assess compact considerations (in Colorado). | CWCB | Complete | | | | | | |
| I.B.4. | Preliminary notice of bi-level acceptance (in Colorado), dependent on development of flow recommendations by FWS. | CWCB | | | | 3/98 | | | |
| I.C. | Legally protect identified flows (dependent on development of initial flow recommendations). | | | | | | | | |
| I.C.1. | Protect flows in Colorado. | | | | | | | | |
| I.C.1.a. | Appropriate. | | | | | | | | |
| I.C.1.a.(1) | CWCB action to advance preliminary to final notice, dependent on development of flow recommendations by FWS. | CWCB | | | | 7/98 | | | |
| >* I.C.1.a.(2) | CWCB filing, dependent on development of flow recommendations by FWS. | CWCB | | | | | 12/98 | | |
| >* I.C.1.a.(3) | Water court adjudication (litigation dependent) | CWCB | | | | | | 12/01 | |
| I.C.1.d. | Evaluate other options to protect flows. | TBD | | | X | | | | |
| >* I.C.1.e. | Implement other options. | TBD | | | | X | | | |
| I.C.2. | Protect flows in Utah. | | | | | | | | |
| I.C.2.a. | Hold public meeting to establish future appropriation policy. | UT | | | X | | | | |
| I.C.2.b. | Adopt and implement new policy (new appropriations subject to flow criteria). | UT | | | X | | | | |
| >* I.C.2.c. | Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights. | UT | | | | X | | | |
| I.D. | Review initial recommendations and legal protection in Colorado | CWCB | Ongoing | | | | | | X |
| II. | RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE) | | | | | | | | |
| II.A. | Restore native fish passage at instream barriers. | | | | | | | | |
| II.A.1. | Assess and make recommendations for fish passage at Taylor Draw. | PD | | | | | 5/96 | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----------|--|--------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| >* | | | | | | | | | |
| II.A.2. | Implement Taylor Draw passage recommendation as approved by Recovery Program. | BR | | | X | | | | |
| II.B. | Support actions to reduce or eliminate contaminant impacts of petroleum derivatives. ¹ | FWS-FR | | X | X | X | | | |
| III. | REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT) | | | | | | | | |
| III.A. | Reduce negative interactions between nonnative and endangered fishes. | | | | | | | | |
| III.A.1. | Monitor escapement of nonnative fishes from Kenney Reservoir (especially black crappie and channel catfish). | CDOW | Complete | | | | | | |
| III.B. | Reduce negative impacts to endangered fishes from sportfish management activities. | | | | | | | | |
| III.B.1. | Assess adequacy of current regulations and options (including harvest) to reduce negative impacts on native fishes from nonnative sportfish and options to reduce angling mortality on native fishes below Kenney Reservoir. | CDOW | | 4/96 | | | | | |
| V. | MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT) | | | | | | | | |
| V.A. | Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions. | | | | | | | | |
| V.A.1. | Determine relative abundance and fate of Colorado squawfish congregation below Kenney Reservoir. | FWS-FR | Complete | | | | | | |
| V.A.2. | Monitor the White River fish community downstream of Kenney Reservoir to determine long-term effects of mainstream impoundment on the White River. | FWS-FR | Complete | | | | | | |

¹ Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----|---|------|-----------------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| >* | IA.3.a.(3) Deliver (see 15-Mile Reach). | | | | | | | | |
| | IA.3.b. Roller Dam to 15 Mile Reach (concurrent with Rifle to Roller Dam activities, also dependent on flow recommendation). | | | | | | | | |
| >* | IA.3.b.(1) Acquire (see 15-Mile Reach). | | | | | | | | |
| | IA.3.b.(2) Appropriate. | | | | | | | | |
| | IA.3.b.(2)(a) CWCB action to advance preliminary notice to final | CWCB | | | | 11/97 | | | |
| >* | IA.3.b.(2)(b) CWCB filing. | CWCB | | | | 12/97 | | | |
| >* | IA.3.b.(2)(c) Water court adjudication (litigation dependent) | CWCB | | | | | | | 12/00 |
| >* | IA.3.b.(3) Deliver (see 15-Mile Reach). | | | | | | | | |
| | IA.3.c. 15-Mile Reach. | | | | | | | | |
| | IA.3.c.(1) Acquire. | | | | | | | | |
| | IA.3.c.(1)(a) Assess, acquire and convert water rights to instream flows (process may be repeated). | CWCB | Ongoing until flow recs. achieved | | | | | | |
| | IA.3.c.(1)(b) Ruedi. | | | | | | | | |
| >* | IA.3.c.(1)(b)i) Short-term lease of remaining water from Ruedi Resv. Which currently is estimated at up to 21,650 af. (Note: this is in addition to the 10,000 af [5,000/5,000] EIS commitment.) | BR | Ongoing until 12/97 agreement | 6/96 | X | X | | | |
| | IA.3.c.(1)(b)ii) Evaluate options for use of uncommitted Ruedi Reservoir water following Round II sales. | BR | Complete | | | | | | |
| >* | IA.3.c.(1)(b)iii) After Ruedi Round II water sales are completed, or commitments to contracts agreed to, enter into interim agreement for remaining uncommitted water from Ruedi Reservoir. | BR | Legislation dependent | | | 12/97 | | | |
| | IA.3.c.(2) Initially Appropriate. | | | | | | | | |
| | IA.3.c.(2)(a) July - September. | | | | | | | | |
| | IA.3.c.(2)(a)i) 581 cfs. | | | | | | | | |
| | IA.3.c.(2)(a)ia) CWCB action to advance preliminary notice to final. | CWCB | Complete | | | | | | |
| >* | IA.3.c.(2)(a)ib) CWCB filing. | CWCB | Complete | | | | | | |
| >* | IA.3.c.(2)(a)ic) Water court adjudication (litigation dependent) | CWCB | | 6/96 | | | | | |
| | IA.3.c.(2)(a)ij) For flows up to flow recommendation. | | | | | | | | |
| | IA.3.c.(2)(a)ija) CWCB action to advance preliminary notice to final. | CWCB | Complete | | | | | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----|---|-------|---|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| >* | CWCB filing. | CWCB | Complete | 12/95 | | | | | |
| >* | Water court adjudication (litigation dependent) | CWCB | | | | | 12/98 | | |
| | Irrigation season return flows. | | | | | | | | |
| | CWCB action to advance preliminary notice to final. | CWCB | Complete | | | | | | |
| >* | CWCB filing. (300 cfs) | CWCB | Complete | 12/95 | | | | | |
| >* | Water court adjudication (litigation dependent) | CWCB | | 12/97 | | | | | |
| | October - March | | | | | | | | |
| | CWCB action to advance preliminary notice to final. | CWCB | Complete | | | | | | |
| >* | CWCB filing. | CWCB | Complete | 12/95 | | | | | |
| >* | Water court adjudication (litigation dependent) | CWCB | | | | | 12/98 | | |
| | April - June. | | | | | | | | |
| | CWCB action to advance preliminary notice to final. | CWCB | Complete | | | | | | |
| >* | CWCB filing. | CWCB | Complete | 12/95 | | | | | |
| >* | Water court adjudication (litigation dependent) | CWCB | | | | | 12/98 | | |
| | Deliver. | | | | | | | | |
| >* | Pursuant to Ruedi Biological Opinion, deliver 5,000af annually & an additional 5,000af 4 out of 5 years (ongoing and protect by short-term agreement). | BR | Ongoing | X | X | X | X | X | X |
| | Pursuant to Wolford Mountain (Muddy Creek) Biological Opinion, deliver water (dependent on reservoir construction and Program success in obtaining water from other sources). | CRWCD | Ongoing | X | X | X | X | X | X |
| | Coordinated reservoir operations. | | | | | | | | |
| | Evaluate. | BR | | X | 6/97 | | | | |
| >* | Implement. | BR | | X | X | X | X | X | X |
| | Collbran Project | | | | | | | | |
| | Evaluate. | BR | Complete | | | | | | |
| | Implement & protect. | | | | | | | | |
| | File for change in use to include instream flows. | BR | Complete | | | | | | |
| >* | Enter contract. | BR | Litigation/ legislation dependent | | | | | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|-------------|--|--------|---------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| | Appropriate. | | | | | | | | |
| I.B.3.b. | | CWCB | | | | | | | |
| I.B.3.b.(1) | CWCB action to advance preliminary to final notice. | | | | | | 12/98 | | |
| I.B.3.b.(2) | CWCB filing. | CWCB | | | | | 3/99 | | |
| I.B.3.b.(3) | Water court adjudication (litigation dependent) | CWCB | | | | | | | 3/02 |
| I.B.3.c. | Deliver and legally protect flows from Aspinall (see Colorado River above Gunnison and Gunnison River). | | | | | | | | |
| I.B.3.c.(1) | Operate Aspinall to provide test flows. | BR | | X | X | X | X | | |
| I.B.3.c.(2) | Operate Aspinall to provide flows pursuant to biological opinion. | BR | | | | | 6/99 | | |
| I.B.4. | Review initial recommendations and legal protection. | CWCB | Ongoing | | | | | | |
| I.C. | Colorado River from Colorado-Utah State line to Green River (Flow recommendations needed.) | | | | | | | | |
| I.C.1. | Initially identify year-round flows needed for recovery. | FWS-FR | | X | X | 3/98 | | | |
| I.C.2. | State acceptance of initial flow recommendations. | | | | | | | | |
| I.C.2.a. | Review scientific basis. | UT | | | | 6/98 | | | |
| I.C.2.b. | Assess legal and physical availability of water. | UT | | | | 6/98 | | | |
| I.C.3. | Legally protect identified flows. | | | | | | | | |
| I.C.3.a. | Hold public meeting to establish future appropriation policy. | UT | | | | | | | X |
| I.C.3.b. | Adopt and implement new policy (new appropriations subject to flow criteria). | UT | | | | | | | X |
| I.C.3.c. | Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights. | UT | | | | | | | X |
| I.D. | Colorado River below Green River | | | | | | | | |
| I.D.1. | Initially identify year-round flows needed for recovery. | FWS | | | | | | | X |
| I.D.2. | State acceptance of initial flow recommendations (dependent on development of initial flow recommendations). | | | | | | | | |
| I.D.2.a. | Review scientific basis. | UT | | | | | | | X |
| I.D.2.b. | Assess legal and physical availability of water. | UT | | | | | | | X |
| I.D.3. | Legally protect identified flows (dependent on development of initial flow recommendations). | | | | | | | | |
| I.D.3.a. | Hold public meeting to establish future appropriation policy. | UT | | | | | | | X |
| I.D.3.b. | Adopt and implement new policy (new appropriations subject to flow criteria). | UT | | | | | | | X |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|-----------|---|--------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| >* | I.D.3.c. Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights. | UT | | | | | | | X |
| II. | RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE) | | | | | | | | |
| II.A. | Restore and manage flooded bottomland habitat. | | | | | | | | |
| II.A.1. | 29-1/2 Road Gravel Pit | | | | | | | | |
| II.A.1.a. | Develop and approve management plans. | FWS-FR | Complete | | | | | | |
| II.A.1.b. | Site design/complete environmental compliance. | BR | Complete | | | | | | |
| II.A.1.c. | Construct. | BR | Complete | 3/96 | | | | | |
| II.A.1.d. | Operate and maintain. | BR | Ongoing | X | X | X | X | X | X |
| II.A.1.e. | Monitor and evaluate success; modify as needed. | FWS-FR | | X | X | | | | |
| II.A.2. | Adobe Creek | | | | | | | | |
| II.A.2.a. | Develop and approve management plans. | FWS-FR | Complete | | | | | | |
| II.A.2.b. | Site design/complete environmental compliance. | BR | Complete | | | | | | |
| II.A.2.c. | Construct. | BR | Complete | 3/96 | | | | | |
| II.A.2.d. | Operate and maintain. | BR | Ongoing | X | X | X | X | X | X |
| II.A.2.e. | Monitor and evaluate success; modify as needed. | FWS-FR | | X | X | | | | |
| II.A.3. | Walter Walker. | | | | | | | | |
| II.A.3.a. | Develop and approve management plans. | FWS-FR | Complete | | | | | | |
| II.A.3.b. | Site design/complete environmental compliance. | BR | Complete | | | | | | |
| II.A.3.c. | Construct. | BR | | 8/96 | | | | | |
| II.A.3.d. | Operate and maintain. | BR | Ongoing | X | X | X | X | X | X |
| II.A.3.e. | Monitor and evaluate success; modify as needed. | FWS-FR | | X | X | | | | |
| II.A.4. | Develop and implement levee removal strategy at high-priority sites. | PD | | X | | | | | |
| II.A.4.a. | Preconstruction (contaminants screening, floodability assessments, environmental compliance, design & engineering. | BR | | X | X | X | X | X | X |
| II.A.4.b. | Construction (levee breaching). | BR | | X | X | X | X | X | X |
| II.A.4.c. | Evaluation | FWS | | X | X | X | X | X | X |
| II.A.5. | Acquire interest in high-priority flooded bottomland habitats. | | | | | | | | |
| II.A.5.a. | Identify and evaluate sites. | FWS | | X | X | 9/98 | | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----|---|-----------|---------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| | Pre-acquisition planning and identification of acquisition options. | PD | | X | X | | | | |
| | Conduct appraisal/NEPA compliance. | PD | | X | X | X | | | |
| >* | Negotiate and acquire. | PD | | | X | X | | | |
| | Evaluate effectiveness of land acquisition activities and provide recommendations | PD | | | | X | X | | |
| | Restore native fish passage at instream barriers. | | | | | | | | |
| | Restore passage at Grand Valley Irrigation Co. Diversion Dam (Palisade) | | | | | | | | |
| | Evaluate and implement viable options to restore fish passage. | BR/FWS | | X | X | | | | |
| | Obtain landowner consent/agreement. | BR | | X | X | | | | |
| | Site design/environmental compliance. | BR | | X | X | | | | |
| >* | Construct | BR | | 3/97 | | | | | |
| >* | Operate and maintain. | FWS-FR/BR | Ongoing | | X | X | X | X | X |
| | Monitor and evaluate success. | FWS-FR/BR | | | X | X | | | |
| | Restore fish passage at Price Stubb. | | | | | | | | |
| | Evaluate and implement viable options. | | | | | | | | |
| | Obtain landowner consent/agreement. | BR | | | X | | | | |
| | Site design/environmental compliance. | BR | | | X | | | | |
| >* | Construct | BR | | | X | 3/98 | | | |
| >* | Operate and maintain. | TBD | | | | X | X | X | X |
| | Monitor and evaluate success. | FWS-FR/BR | | | | X | X | | |
| | Restore fish passage at Government Highline (Roller Dam). | | | | | | | | |
| | Evaluate and implement viable options. | | | | | | | | |
| | Site design/environmental compliance. | BR | | | | X | X | | |
| >* | Construct | BR | | | | | | 3/00 | |
| >* | Operate and maintain. | BR | | | | | | X | X |
| | Monitor and evaluate success. | FWS-FR/BR | | | | | | X | X |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|--------------|---|-----------------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| II.C. | Support actions to reduce or eliminate contaminant impacts of heavy metals and selenium in the Grand Valley. ¹ | | | X | X | X | X | X | X |
| III. | REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT) | | | | | | | | |
| III.A. | Reduce negative impacts to endangered fishes from sportfish management activities. | | | | | | | | |
| III.A.1. | Determine relationship between Aspinall test flows and relative abundance of young Colorado squawfish and nonnative fishes in nursery habitat. | UDWR/ FWS-FR | | X | 9/97 | | | | |
| III.A.2. | Increase law enforcement activity to decrease angling mortality. | CDOW | Ongoing | X | X | X | X | X | X |
| III.A.3. | Reclaim ponds in the 10-year floodplain. | CDOW | | X | X | | | | |
| III.A.3.a. | Evaluate and make recommendations. | TBD | | | | X | 12/98 | | |
| IV. | MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES) | | | | | | | | |
| IV.A. | Augment or restore populations as needed. | | | | | | | | |
| IV.A.1. | Razorback sucker. | | | | | | | | |
| IV.A.1.a. | Develop experimental augmentation plan and seek Program acceptance. | FWS-FR | Complete | | | | | | |
| IV.A.1.b. | Implement experimental augmentation plan. | | | | | | | | |
| IV.A.1.b.(1) | Acquire fish. | FWS-FR | | | | X | X | | |
| IV.A.1.b.(2) | Stock fish. | FWS-FR | | | | X | X | | |
| IV.A.1.b.(3) | Monitor and evaluate results; make recommendations regarding further augmentation. | FWS-FR | | | | X | X | | |
| IV.A.2. | Monitor the fish community in the upper Colorado River (above Palisade and develop management action plan, including recommendations for Colorado squawfish and razorback sucker augmentation). | CDOW | | 5/96 | | | | | |
| IV.A.2.a. | Establish Program position on recommended augmentation plan. | PD | | 7/96 | | | | | |
| V. | MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT) | | | | | | | | |
| V.A. | Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions. | | | | | | | | |
| V.A.1. | Determine Colorado squawfish larval drift into Lake Powell. | NPS | Complete | | | | | | |

¹ Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----|--|-----------------|------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| >* | I.C.3.b.(1) Deliver flows. | BR | | X | X | X | X | | |
| >* | I.C.3.b.(2) Protect research flows. | FWS/BR/ CWCB | Complete | X | | | | | |
| | I.C.3.c. Flows from Paonia Reservoir in accordance with Biological Opinion. | | | | | | | | |
| >* | I.C.3.c.(1) Deliver flows. | BR | Ongoing | X | X | X | X | X | X |
| | I.C.3.d. Flows from Aspinall Unit pursuant to Aspinall Biological Opinion. | | | | | | | | |
| | I.C.3.d.(1) Determine if change in water right and/or contract is needed. | BR | Complete | | | | | | |
| | I.C.3.d.(3) Enter into contract if needed. | BR | | | | | 6/99 | | |
| >* | I.C.3.d.(4) Deliver flows. | BR | Begin 6/99, ongoing | | | | X | X | X |
| | I.D. Review initial recommendations and legal protection. | CWCB | Ongoing | | | | | | |
| | II. RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE) | | | | | | | | |
| | II.A. Restore and manage flooded bottomland habitat. | | | | | | | | |
| | II.A.1. Develop management plan for Escalante State Wildlife Area. | | Complete 5/94 | | | | | | |
| | II.A.2. Develop and implement levee removal strategy at high-priority sites | PD | | X | | | | | |
| | II.A.2.a. Preconstruction (contaminants screening, floodability assessments, environmental compliance, design & engineering). | BR | | | X | X | | | |
| >* | II.A.2.b. Construction (levee removal). | BR | | | | X | X | X | X |
| | II.A.2.c. Evaluation. | FWS | | | | X | X | X | X |
| | II.A.3. Acquire interest in high-priority flooded bottomland habitats. | | | | | | | | |
| | II.A.3.a. Identify and evaluate sites. | FWS | | X | X | 9/98 | | | |
| | II.A.3.b. Pre-acquisition planning and identification of acquisition options. | PD | | X | X | | | | |
| | II.A.3.c. Conduct appraisal/NEPA compliance. | PD | | X | X | X | | | |
| >* | II.A.3.d. Negotiate & acquire. | PD | | | X | X | | | |
| | II.A.3.e. Evaluate effectiveness of land acquisition activities and provide recommendations. | PD | | | | X | X | | |
| | II.B. Restore native fish passage at instream barriers. | | | | | | | | |
| | II.B.1. Restore passage at Redlands. | | | | | | | | |
| | II.B.1.a. Assess and make recommendations for fish passage. | FWS | Complete | | | | | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|-----------|--|-----------|------------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| | Implement viable options to restore fish passage. | | | | | | | | |
| | Design passage, conduct NEPA compliance. | BR | Complete | | | | | | |
| >* | Construct fish ladder. | BR | | 4/96 | | | | | |
| >* | Operate and maintain fish ladder. | FWS-FR/BR | Ongoing | X | X | X | X | | X |
| | Monitor and evaluate success. | FWS-FR/BR | Through 99 | X | X | | | | |
| | Identify minimum flows below Redlands Diversion Dam | FWS-FR | | 3/96 | | | | | |
| >* | Deliver flows below Redlands. | BR | | | X | X | X | X | X |
| | Restore passage at Hartland. | | | | | | | | |
| | Assess and make recommendations for fish passage. | FWS-FR | Complete | | | | | | |
| | Evaluate and implement viable options to restore fish passage. | BR/FWS | | X | | | | | |
| | Design passage, conduct NEPA compliance. | BR | | X | 3/97 | | | | |
| >* | Construct fish passage. | BR | | | X | 3/98 | | | |
| >* | Operate and maintain. | TBD | | | | X | X | X | X |
| | Monitor and evaluate success. | FWS | | | | X | X | | |
| | Support actions to reduce or eliminate contaminant impacts (especially selenium). ¹ | FWS-ES | | X | X | X | | | |
| III. | REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT) | | | | | | | | |
| | Reduce negative impacts to endangered fishes from sportfish management activities. | | | | | | | | |
| III.A. | Evaluate angling mortality on endangered fishes below Redlands. | CDOW | | | X | 12/97 | | | |
| III.A.2. | Increase law enforcement activity to decrease angling mortality. | CDOW | Ongoing | X | X | X | X | X | X |
| IV. | MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES) | | | | | | | | |
| | Augment or restore populations as needed. | | | | | | | | |
| IV.A. | Razorback sucker. | | | | | | | | |
| IV.A.1.a. | Develop experimental augmentation plan and seek Program acceptance. | FWS-FR | complete | | | | | | |
| IV.A.1.b. | Implement experimental augmentation plan. (Goal: 10 adults/river mile.) | | | | | | | | |

¹ Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|--------------|---|--------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| IV.A.1.b.(1) | Acquire fish. | FWS-FR | Ongoing | X | X | X | X | | |
| IV.A.1.b.(2) | Stock fish. | FWS-FR | Ongoing | X | X | X | X | | |
| IV.A.1.b.(3) | Monitor and evaluate results; make recommendations regarding further augmentation. | FWS-FR | Ongoing | X | X | X | X | | |
| V. | MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT) | | | | | | | | |
| V.A. | Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions. | | | | | | | | |
| V.A.1. | Conduct Colorado squawfish and razorback sucker inventory in Gunnison River above Redlands. | FWS-FR | Complete | | | | | | |
| V.A.2. | Identify additional spawning sites of endangered fishes on the Gunnison River. | FWS-FR | Complete | | | | | | |

| | ACTIVITY | WHO | STATUS | FY96 10/95-9/96 | FY97 10/96-9/97 | FY 98 10/97-9/98 | FY99 10/98-9/99 | FY00 10/99-9/00 | OUT YEAR |
|----------|--|------|----------|--------------------|--------------------|---------------------|--------------------|--------------------|-------------|
| III. | REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT) | | | | | | | | |
| III.A. | Reduce negative interactions between nonnative and endangered fishes. | | | | | | | | |
| III.A.1. | Assess need and options to control nonnative fish escapement from McPhee Reservoir. | BR | Complete | | | | | | |
| III.B. | Reduce negative impacts to endangered fishes from sportfish management activities. | | | | | | | | |
| III.B.1. | Identify potential conflicts between present fish management practices in McPhee Reservoir and endangered fishes and formulate an alternative management plan. | CDOW | Complete | 12/95 | | | | | |

5.0 RECOVERY ACTION PLAN BUDGET PROJECTIONS (IN MILLIONS)

| ACTIVITY/PROJECT | FY 96 | FY 97 | FY 98 | FY 99 | FY 00 | FY 01 | FY 02 | FY 03 | FY96 - FY03 | BUDGET COMMENTS & QUALIFIERS |
|--|-------|--------|--------|--------|--------|--------|-------|-------|-------------|---|
| ANNUAL OPERATING BUDGET | 3.25 | 3.37 | 3.51 | 3.65 | 3.80 | 4.00 | 4.16 | 4.33 | 30.0700 | |
| FACILITY OPERATION & MAINTENANCE | 0.460 | 0.818 | 1.015 | 1.230 | 1.436 | 1.487 | 1.539 | 1.61 | 9.5950 | |
| CAPITAL FUNDING: | | | | | | | | | | |
| Redlands fish passage (entrainment) | 0.171 | 0.100 | | | | | | | 0.2710 | |
| Hartland fish passage | | 0.175 | 0.600 | | | | | | 0.7750 | BR estimate: will appear in FY 97 SOW. |
| Price/Stubb fish passage | 0.125 | 0.575 | 1.399 | | | | | | 2.0990 | Costs higher than projected in FY 96 SOW (based on additional site information). |
| Government Highline (Roller Dam or "Cameo") fish passage | | 0.050 | 0.350 | 1.500 | 1.400 | | | | 3.3000 | BR estimate: will appear in FY 97 SOW. |
| Grand Valley Irrigation Co. fish passage | 0.125 | 0.600 | | | | | | | 0.7250 | |
| Yampa River fish passage | 0.075 | 0.200 | 0.900 | 0.923 | 0.680 | 0.695 | | | 3.4730 | Actual costs will depend on outcome of study to determine need for passage. If costs less than anticipated, funds will be reprogrammed to other high-priority capital recovery activities. Costs reflect Recovery Program cost share estimated at 90% beginning in FY 98. |
| Tusher Wash fish passage | 0.024 | | 0.150 | 0.600 | | | | | 0.7740 | Assumes fish passage is required. |
| Taylor Draw fish passage | 0.006 | | | | | | | | 0.0060 | Assumes no fish ladder construction. |
| Yampa River operation and management plan | 0.680 | 1.700 | 1.500 | 5.100 | 4.250 | 3.910 | | | 17.1400 | Budget projections from FY 98 forward assume enlargement of Elkhead Reservoir. Depending on outcome of NEPA process, total cost could range from 2.38M (no Elkhead enlargement) to 17.14M. Costs reflect Recovery Program cost share estimated at 50% beginning in FY 98. |
| Grand Valley water management | 0.320 | 2.250 | 2.490 | | | | | | 5.0600 | Budget reflects acceleration of project schedule over what appears in FY 96 SOW. Costs reflect Recovery Program cost share estimated at 75% beginning in FY 97. |
| Coordinated reservoir operations | 0.200 | 0.200 | | | | | | | 0.4000 | |
| Other water acquisition | | 0.500 | 0.750 | 1.000 | 1.04 | 1.08 | 1.12 | 1.17 | 6.6600 | No SOW. Program Director estimate of costs of continuing efforts to acquire water through 2003. Not in BR budget request. |
| Bottomland restoration | 2.060 | 2.640 | 2.588 | 2.148 | 1.123 | 1.790 | 1.860 | 1.930 | 16.1390 | FY 97 cost higher than reflected in FY 96 SOW due to levee removal. Costs from FY 98 forward based on best estimates (FY 01-03 are Program Director estimates). |
| Endangered fish hatchery facilities | 1.942 | 2.000 | 2.400 | | | | | | 6.3420 | FY 98 cost contingent upon Program needs. |
| Colorado River pond reclamation | 0.075 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 | 0.4250 | Assumes matching funds from CDOW. |
| Gravel pit nonnative fish screening | | 0.100 | 0.100 | | | | | | 0.2000 | |
| Elkhead/Highline nonnative fish screening | 0.075 | 0.500 | | | | | | | 0.5750 | Cost is very rough estimate. |
| CAPITAL PROJECTS SUBTOTAL | 5.878 | 11.64 | 13.277 | 11.321 | 8.543 | 7.525 | 3.03 | 3.15 | 64.3640 | |
| GRAND TOTAL | 9.588 | 15.828 | 17.802 | 16.201 | 13.779 | 13.012 | 8.729 | 9.09 | 104.0290 | |

6.0 LITERATURE CITED

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APPENDIX: CRITICAL HABITAT ANALYSIS

BACKGROUND

The final rule determining critical habitat for the four endangered fishes was published in the Federal Register on March 21, 1994, and the final designation became effective on April 20, 1994. As stated in the Section 7 Agreement and in the RIPRAP, the Recovery Program is intended to serve as the reasonable and prudent alternative to avoid the likely destruction or adverse modification of critical habitat, as well as to avoid the likelihood of jeopardy to the continued existence of the endangered fishes resulting from depletion impacts of new projects and all existing or past impacts related to historic water projects with the exception of the discharge by historic projects of pollutants such as trace elements, heavy metals, and pesticides. Once critical habitat was designated, the Service reviewed the RIPRAP, and in coordination with the Recovery Program's Management Committee, developed modifications to fulfill this intent.

The Service's review concluded that many of the actions in the existing RIPRAP would not only contribute to allowing the Recovery Program to continue to serve as the reasonable and prudent alternative to avoid the likelihood of jeopardy to the continued existence of the endangered fishes, but also would avoid the likely destruction or adverse modification of critical habitat for the endangered fishes. Specifically, the RIPRAP already included several of the following kinds of habitat-related actions for each subbasin (except the Dolores River): instream flow acquisition, legal protection, and delivery from modified reservoir operations; fish passage restoration; and flooded bottomland restoration. Thus, the critical habitat modifications to the RIPRAP were not extensive. They were primarily intended to provide further definition to recovery actions already in the RIPRAP and to provide increased certainty that the Recovery Program can continue to serve as the reasonable and prudent alternative for projects subject to Section 7 consultations. Since many historic projects will be required to reinitiate Section 7 consultation with the Service due to the critical habitat designation, the Service encouraged Recovery Program participants to complete these RIPRAP actions as quickly as possible to facilitate fish recovery.

Destruction or adverse modification of critical habitat is defined at 50 CFR 402.02 as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Section 7 consultation is initiated by a Federal Agency when its action may affect critical habitat by impacting any of the primary constituent elements or reducing the potential of critical habitat to develop those elements. The primary constituent elements defined in the final rule as necessary for survival and recovery of the four Colorado River endangered fishes include, but are not limited to, 1) water (quantity and quality), 2) physical habitat (areas inhabited or potentially habitable, including river channel, bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas); and 3) biological environment (food supply, predation, and competition). The Service reviewed the RIPRAP to determine if it addressed these constituent elements and to identify existing and new actions that will contribute to the RIPRAP serving as a reasonable and prudent alternative to the likely destruction or adverse modification of critical habitat. Then, in coordination with the

Management Committee, the Service recommended additions needed to address all of the constituent elements, to better define the expected result of the recovery action, and to increase the certainty that the constituent elements of critical habitat would be protected.

MODIFICATIONS

1. Instream Flow Protection: Modifications were made under this recovery element to protect the water quantity constituent element.
 - a. Adjudication of the instream flow appropriations to be filed by the Colorado Water Conservation Board (on the Yampa, Little Snake, White, Colorado, and Gunnison rivers) was added since these instream flow appropriation filings will not be legally protected until they are adjudicated in water court. Adjudication may take up to three years after filing, depending on the amount of litigation.
 - b. To provide more immediate habitat improvements in the Grand Valley area via instream flows, a modification was made under water acquisition for the 15-Mile Reach to enter into an interim agreement for uncommitted water remaining in Ruedi Reservoir after Round II water sales are completed or commitments to contracts are agreed to. If flow recommendations for the 15-mile reach are met from other sources during this interim agreement (thereby causing the additional water from Ruedi to exceed the flow recommendations) Ruedi would be relieved of this additional obligation. At the end of the interim agreement (whether the flow recommendations have been met or not), Reclamation may pursue additional water sales, however, these sales would be subject to review under Section 7 of the Endangered Species Act.
2. Habitat Restoration: Modifications were made under this recovery element to protect the physical habitat constituent element.
 - a. Access to historically inundated floodplain habitats is believed to be very important to recovery of the razorback sucker and Colorado squawfish. Although the Recovery Program has begun a program to evaluate and restore flooded bottomland areas, the fishes riverine habitat has been and continues to be so channelized by levees, dikes, rip-rap, and tamarisk, that broader floodplain restoration and protection (e.g., through mechanisms such as landowner incentives, conservation easements, and perhaps zoning) is needed. Recovery Program participants are not yet sure exactly how such mechanisms might be implemented so development of an issue paper on restoration and protection of the floodplain has been recommended. The issue paper will first address what restoration and protection are needed and then how they might be accomplished. After completion of the issue paper, viable options will be identified and a restoration strategy developed for selected geographic areas (e.g. Grand Valley and Ashley Valley). Floodplain restoration activities may be implemented by the Recovery Program or by Program participants individually. Responsibilities of

other agencies will be identified in the issue paper and actions implemented consistent with their authorities outside the Recovery Program.

- b. The Recovery Program has been evaluating agricultural diversion structures in the Yampa River and has discovered that although not all of these structures impede Colorado squawfish passage, the annual bulldozing in critical habitat in the river that is required to maintain many of these structures may destroy or adversely modify fish habitat. Upgrading these structures so that they are more secure would eliminate the need for this annual bulldozing and modification of critical habitat.
 - c. Fish passage structures are planned for a number of diversion dams in the Upper Basin in the current RIPRAP. However, without screens or "entrainment structures," adult fish, especially razorback suckers may go into the diversion canals. To keep fish in the more secure river habitat, a modification was made to include an entrainment structure on the proposed passage structure at the Government Highline diversion (Roller Dam). Also, the need for an entrainment preclusion structure at Redlands Diversion Dam will be evaluated after construction of the fish ladder there.
3. Reduction of Negative Impacts of Nonnative Fishes and Sportfish Management Activities: Modifications were made under this recovery element to protect the constituent element of the fishes biological environment.
- a. Competition with and predation from introduced species is widely assumed to have played a role in the decline of the endangered fishes. The Recovery Program has been and continues to assess options to reduce negative impacts of problem nonnative species, sportfish management, and angling mortality. Although we cannot yet fully predict the results of implementing some of these management options, we need to begin to implement the most viable ones. Therefore, actions have been added to implement (in cooperation with the States) viable measures which will decrease negative impacts of certain nonnative fishes, sportfish management, and angling mortality. Specific actions were added to selectively remove northern pike from the Yampa River and northern pike and centrarchids from the Gunnison River and possibly Paonia Reservoir.