

DRAFT

SECTION 7 CONSULTATION, SUFFICIENT PROGRESS,
AND HISTORIC PROJECTS AGREEMENT

AND

RECOVERY ACTION PLAN

**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



SEPTEMBER 3, 1993



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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SEP 7 1993

To All Interested Parties:

Enclosed for your review and comment are the Section 7 Consultation, Sufficient Progress, and Historic Projects Agreement (Part One) and Recovery Action Plan (Part Two) for the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin.

Pursuant to the Federal Register notice dated September 3, 1993, comments will be received through October 4, 1993, and should be submitted to:

Assistant Regional Director
Ecological Services
Attn: John Hamill
U.S. Fish and Wildlife Service
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Denver, Colorado 80225

The Fish and Wildlife Service, in consultation with the Management Committee of the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, will review all comments received prior to finalizing these documents.

Sincerely,

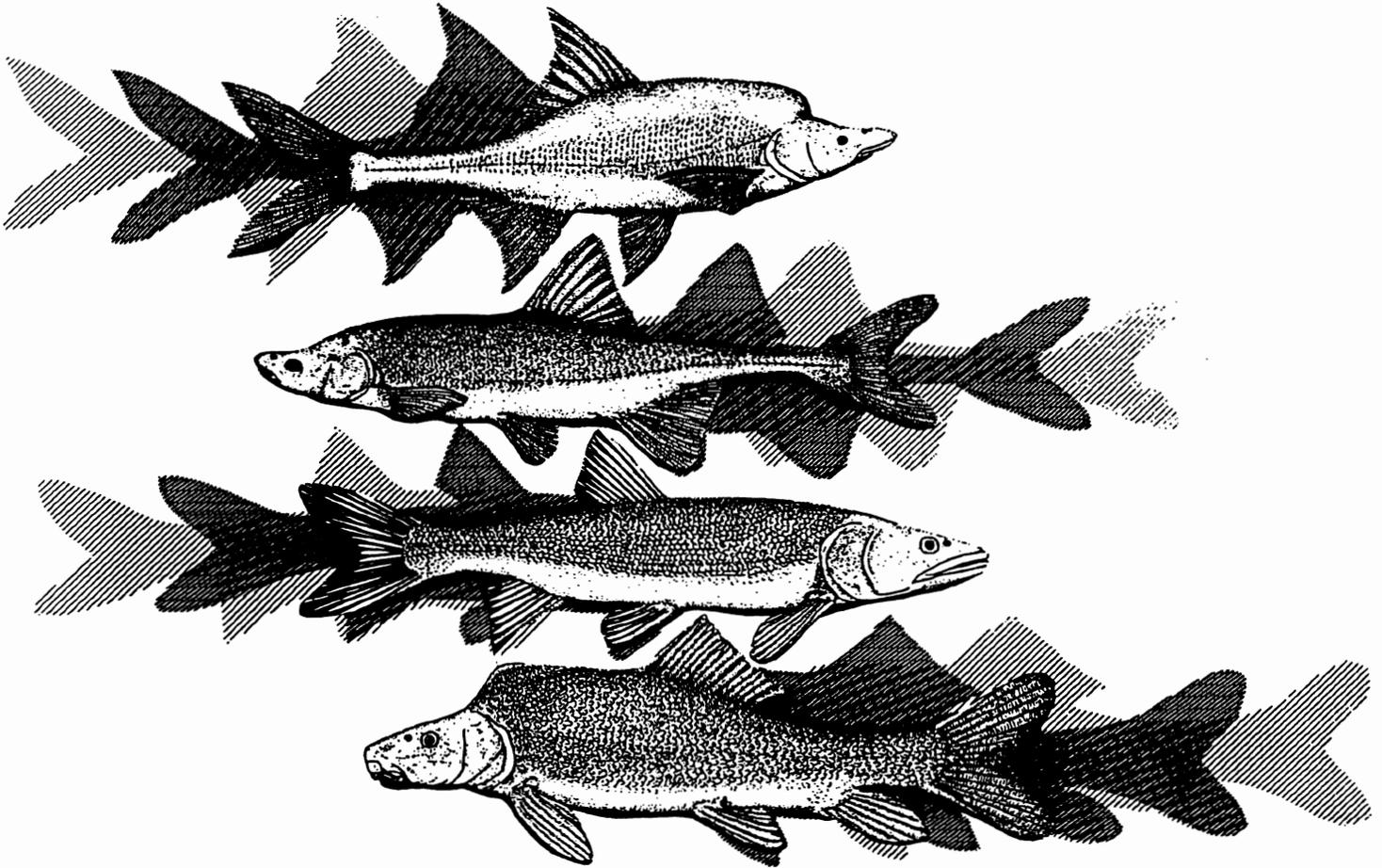
Regional Director

Enclosures

① Case for Hamill
② Copies to you

RESPONSE	RESP DATE	CONTR #	FIDR #	KYWD	DATE TO	INITIALS

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PREFACE

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) outlines 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 timeframes 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.

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

March 11, 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, pesticides, etc.

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, pesticides, etc.

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) 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, I&E, 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 eventuality, 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 in September 1993, 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). Further, the Recovery Program is intended to serve as a reasonable and prudent alternative to avoid the likelihood of jeopardy for the endangered fishes 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, pesticides, etc.) associated with historic 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 chub (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 for each species (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, these goals apply to both basins. The Recovery Program provides for the coordinated implementation of these recovery plans for 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 chub 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 for the endangered fishes in Section 7 consultations for depletion impacts of new projects and all existing or past impacts related to historic projects (except impacts from contaminants) in the Upper Basin, in accordance with the March 11, 1993 Section 7 Agreement. The RIPRAP was developed in support of that Agreement.

1.4 ESTIMATED COST OF RECOVERY ACTIONS

Over the next 10 years, the budget for the Recovery Program is expected to total \$84 to \$134 million (FY 93 dollars)¹. The funding is expected to come from the following sources:

- a. An annual operating budget of approximately \$2.7 million (or \$27 million over the next 10 years) will be contributed by the U.S. Bureau of Reclamation (hydropower revenues); the U.S. Fish and Wildlife Service; and the States of Colorado, Utah, and Wyoming. In addition, operation and maintenance of refugia and hatchery facilities is expected to cost approximately \$500,000 per year, or \$5 million over the next 10 years.
- b. Congressional appropriations of \$50-\$100 million will be requested over the next 10 years, of which approximately \$18-\$50 million will be used to acquire water and water rights to implement and maintain adequate in-stream flows for the fish, and \$32-\$50 million is for capital construction projects such as building fishways, hatcheries, and/or restoring flooded bottomlands. The range of costs reflects uncertainties regarding the scope of several projects and the degree to which other project beneficiaries will be expected to share in the costs.

¹ This is a general estimate with a substantial range that is not based on the budget projections in Section 5.0.

- c. Water development depletion fees could provide \$1-2 million over the next 10 years. 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 of \$11.98 (adjusted annually for inflation) per acre foot of the project's average annual depletion. The actual rate of water development has not been projected.

1.5 MEASURING PROGRESS TOWARD RECOVERY

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 will be most important in determining the extent to which the Recovery Program provides the reasonable and prudent alternatives for projects undergoing Section 7 consultation. These actions are identified by the carat ">" in the Action Plans, and will generally be given highest priority.

The Recovery Program will need to continually evaluate the outcome of the actions identified in the RIPRAP to determine their effectiveness in achieving 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 against accomplishment of the actions identified in the RIPRAP.

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.

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. Recovery Action Plans have been developed for Green and Colorado rivers and their subbasins in the upper basin. A third Recovery Action Plan identifies general recovery program support activities important to the success of the Recovery Program. Each action plan is arranged by specific activities to be accomplished within each of 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; and**
- VII. Provide program planning and support.**

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 basinwide.

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. A task to review instream flow methodologies and assess the technical adequacy of existing recommendations is contained The General Recovery Action Plan to address questions about the Fish and Wildlife Service's existing flow recommendations.

State acceptance of flow recommendations is the next step in instream flow protection. In Colorado, acceptance of those recommendations by the Colorado Water Conservation Board can be made on two levels, based on a review of the scientific basis for the Service's recommendations, on legal and physical water availability, and on an assessment of Compact considerations: One level of state acceptance is legal protection without any special qualifications. The other level is for legal protection that is periodically reviewed and 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 could 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 the mechanism 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 the postponement of the appropriation's priority date. It may take two 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 this case, 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.)

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, 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 the Green River (or other stream) drops below a certain flow, then all water rights approved after such condition was imposed, would be regulated in order of priority. This strategy of conditioning the approval of presently filed and new applications also could be combined with the others listed above and with properly compensated reservoir reoperations.

Based on past legal challenges to the State's authority to impose conditions upon presently filed and new applications, 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.

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 additional 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

Other important elements of habitat protection include restoring and managing 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 bottomland habitat. The Recovery Program is conducting an inventory of all bottomlands adjacent to mainstem upper basin rivers and will classify them according to their perceived value to endangered fish recovery.

Five bottomland sites in the upper basin already have been identified for restoration (two on the Green River, two on the Colorado River, and one on the Gunnison River). Conceptual management plans for restoring these sites are being developed and baseline data are being collected. Where land and/or water rights are needed, the Recovery Program is working to acquire (via lease, purchase, etc.) them. Once management plans are finalized and access secured, restoration and construction activities will begin, and these will be followed by monitoring and evaluation to determine their success in contributing to recovery. Additional sites may be identified for restoration as a result of the bottomland inventory.

Passage barriers have fragmented endangered fish populations and their habitats, resulting in confinement of 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 agricultural diversions in the Yampa River and 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 to date have focused primarily on identifying impacts/interactions and developing nonnative fish stocking procedures. The Recovery Action Plans include a variety of tasks to assess impacts of nonnative fishes where those impacts are still relatively unknown, to identify potential conflicts between reservoir fisheries management and develop alternative management plans, to assess options to prevent nonnative fish escapement from reservoirs, and to assess sportfishing regulations and angling mortality on native fishes. Depending on the results of these evaluative tasks, actions may then be taken to reduce or eliminate impacts of the nonnative fishes.

The states and the Service also are developing procedures for stocking nonnative fishes in the upper basin which also will be reviewed and approved under the Recovery Program. 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. It is intended that all participants in the Recovery Program will abide by and support these procedures.

2.4 IV. CONSERVE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS

Long-term species recovery and viability depends on protecting and managing species genetic resources. This is a very 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 reintroduction; and planning, implementing, and evaluating augmentation or reintroduction of genetic stocks in the wild.

Most of this work is included under the General Recovery Program Support Action Plan, because it applies basinwide. Only subbasin-specific activities of augmenting or restoring genetic stocks are placed under the subbasin Action Plans, these are identified only when the Recovery Program already has firmly concluded that such action is required in a specific subbasin. As additional needs for augmentation or restoration are clearly identified, plans will be developed, fish produced, river reaches restored or augmented with those fish, and the results monitored and evaluated.

Four basic documents are identified to plan, implement, and coordinate genetics management and artificial propagation for the endangered fishes. These are the Genetics Management Guidelines, Genetics Management Plan, Coordinated Hatchery Facility Plan, and the Annual Propagation Operational Plan.

The Genetics Management Guidelines document is the conceptual document. It tells the "why" and "how" of implementing a genetics management plan. It 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. Finally, the document suggests practical activities, methods, and options to incorporate into an operational plan, i.e., capture 10 wild adults from the Yampa river razorback sucker population and breed them using a pedigree mating strategy and rear family lots separately to maintain genetic variability and integrity.

The Genetics Management Plan is the operational document. It tells the "what, who, when, where" of implementation. It identifies specific objectives, tasks, activities, and 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. Improved development and implementation of the Genetics Management Plan relies on genetics data generated from genetics surveys.

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

a 5 x 5 matrix, that is, crossing each of 5 wild males with each of 5 wild females (where this is possible) to result in 25 unique half-sibling family lots for refugia.

Genetics management requires a great deal of operational activity. Refugia/propagation facilities must be planned, built, and operated in a coordinated fashion. For this reason, the General Recovery Program Support Action Plan contains a tasks to: produce an annual Propagation Operational Plan; operate and maintain facilities; and plan, design, and construct additional needed facilities.

Additional facilities are required to meet long-term propagation needs. The plan for these facilities is the Coordinated Hatchery Facility Plan. This Plan: identifies presumptive stocks, defines their present status, trends, and relative priorities, identifies propagation needs for recovery, 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. The annual Propagation Operational Plan identifies high priority fish populations for propagation, numbers of adults and family lots needed from each populations, numbers of fish needed in each family lot, and where these fish will be raised and maintained.

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 subbasin Recovery Action Plans, this element includes activities to identify additional spawning sites and the importance of tributaries which have been investigated only very little. 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. 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 the taxonomy of chub [*Gila*] species and 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.

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); 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.

A public awareness survey is being conducted to determine public awareness and opinion of the endangered fishes and the Recovery Program (this will be repeated every three years or so to monitor changes). Media relations training will be offered to Recovery Program managers to help them better meet the goals of the information and education program. A number of site-specific activities (news releases, public meetings, presentations, publication distribution) are being undertaken to promote understanding and support of Recovery Program actions which may impact specific locations.

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 activities include recovery planning and tracking, 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 identified 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 Chub Recovery Plan (USFWS 1990b) indicates that one of the last known riverine concentrations of bonytail chub was in the Green River within Dinosaur and identifies the Green River in Desolation/Grays Canyon and within Dinosaur as high priority recovery and/or reintroduction 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 of the endangered fishes. A biological opinion was issued on the operation of Flaming Gorge Dam in 1991. This opinion contained "final" 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 will be evaluated through a variety of studies between 1992 and 1997, at which time the biological opinion will be revised.

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 will be to legally protect (by November 1994) 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 1998.

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. A pilot restoration effort is being initiated at the Escalante Ranch wetland near Jensen, Utah and Old Charlie Wash near Ouray, Utah. A management plan for these wetland areas will be completed by March of 1994; implementation of the plan is scheduled for 1994-1996. The management plan will address water control devices to allow for endangered fish access, control of nonnative fishes, stocking of the wetlands with razorback suckers, possible environmental contaminant problems, and other land use or management activities.

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 will be developed in 1994 and implemented in 1995-1998. A similar augmentation plan will be developed for bonytail chubs in 1994-1995, with implementation scheduled for 1995-1998.

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 activity 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 chub and is associated with some of the most recent captures of this very

rare fish. The Bonytail Chub Recovery Plan (USFWS 1990b) identifies the Yampa River within Dinosaur as high priority recovery and/or reintroduction site for the bonytail chub.

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 recently 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 attempting to purchase the Juniper dam water rights from the Colorado River Water Conservation District. The Juniper rights are conditional (undeveloped) water rights which control approximately 75 percent of the flow of the river. The River District has expressed a willingness to consider sale of a portion of these and other Yampa basin rights it holds for conversion to instream flows if a plan to meet the long-term water needs in the Yampa River basin can be developed. If acquired, the Juniper water rights would be converted to instream flows rights to benefit the endangered fishes. A decision to acquire the Juniper rights and/or enlarge Elkhead Reservoir is scheduled for September 1995.

The Colorado Water Conservation Board will also file for junior instream flow water right for the Yampa River by December 1995, following completion of the administrative process set out in the Memorandum of Understanding for the Phase II study on the enlargement of Elkhead Reservoir. If this process is delayed, the Conservation Board will still proceed with this filing for a junior instream flow right. The amount of the filing will depend upon the Board's review and acceptance of the Service's flow recommendation for the Yampa River and the completion of a study to identify the physical and legal availability of water in the Yampa River.

Plans also are under way to rehabilitate several low-height agriculture water diversion dams on the Yampa River to provide for Colorado squawfish passage. Several of the current diversions are believed to be barriers to fish passage during low-flow periods (August-October). Feasibility studies are being conducted in 1994; construction is scheduled to occur between 1997 and 2000.

Several studies are planned to evaluate the importance of the Little Snake River. Initial flow recommendations will be developed and opportunities for improving late summer-early fall base flows will be evaluated in 1996. A detailed management

plan will be developed for the Little Snake River in 1997-98. Inflows from the Little Snake River in Colorado and Wyoming that are necessary to recovery 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

Several studies will be funded by the Central Utah Water Conservancy District as part of its biological assessment of several proposed water projects being considered in the Duchesne River basin. These studies will involve evaluating the importance of the Duchesne River to the endangered fish, determining instream flow requirements in the Duchesne River, and assessing the importance of the Duchesne River to meeting endangered fish flow needs in the Green River. These studies will be completed in 1995.

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 1981 blocked Colorado squawfish migration to the upper portions of the White River.

3.4.2 Recovery Actions

A management plan for the White River will be developed in 1994. This plan will 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 1996, 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 support several very important populations of the endangered fishes. The recovery plans for the Colorado squawfish, humpback chub, and bonytail chub 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 chub 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. Restoration of late summer-early fall flows in the 15-mile reach to levels recommended by the Fish and Wildlife Service is under way. The Bureau of Reclamation has been providing 20,000 acre feet of water from Ruedi Reservoir since 1990. In addition, the Colorado Water Conservation Board currently has an application before State water court for a 581 cfs instream flow right in the 15-mile reach for the months of July, August, and September. The Bureau of Reclamation is currently evaluating several other promising sources of water for the 15-mile reach, including (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 head water areas of the Colorado River to help meet the flow needs of the fish.

The Colorado Water Conservation Board will also file for junior instream flow water right for the 15-mile reach for the winter-spring period by December 1994. The amount of the filing will depend upon the Board's review and acceptance of the Service's flow recommendation for the Colorado River and the completion of a study to identify the physical and legal availability of water in the 15-mile reach. 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.

The Bureau of Reclamation has initiated plans to provide for fish passage at the Price-Stubb dam and the Government Highline dam near Palisade, Colorado. 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. The Colorado Division of Wildlife is also preparing a management plan for the Colorado River between the Government Highline dam and Rifle, Colorado. This plan will address instream flow needs, control of nonnative fishes, and stocking of the reach with Colorado squawfish and razorback sucker.

Beginning in 1994, the Service will experimentally stock razorback suckers in the Colorado River near Rifle and Grand Junction, Colorado. A bonytail reintroduction plan for the Colorado River is scheduled to be completed in 1995. Broodstock/refuge populations of Colorado squawfish, humpback chub, and razorback sucker have been developed from Colorado River stocks.

A gravel pit in the 15-mile reach which periodically floods in the spring is one of five flooded bottomland sites identified for rehabilitation. A management plan will be completed by March of 1994; implementation of the plan is scheduled for 1994-1996. The management plan will address water control devices to allow for flooding and endangered fish access, control of nonnative fishes, stocking of the wetlands with razorback suckers, possible environmental contaminant problems, and other land use or management activities.

3.6 GUNNISON RIVER

3.6.1 Importance

The Gunnison River is currently occupied Colorado squawfish habitat and 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 is currently 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 reintroduction 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. The fish ladder for the Redlands diversion dam will be designed in 1994 and constructed in 1995. The ladder will provide for passage of both razorbacks and squawfish and allow exclusion of nonnative fishes. Flooded bottomlands at the Escalante State Wildlife Area, near Delta, Colorado are one of five sites identified for rehabilitation. A management plan will be completed for this area by March of 1994; implementation of the plan is scheduled for 1994-1996. The management plan will address water control devices to allow for flooding and endangered fish access, control of nonnative fishes, stocking of the wetlands with razorback suckers, possible environmental contaminant problems, and other land use or management activities. A 5-year research plan to evaluate the effects of the Aspinall Unit on the endangered fishes and their habitat will be conducted from 1992 through 1996. During this research period, the Bureau of Reclamation and Western Area Power Administration will provide test flows. The research will culminate with a biological opinion on the operation of the Aspinall Unit in 1997. 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.

In addition to the studies relating to the Aspinall biological opinion, two other activities are under way which will affect the operation of the Aspinall Unit. These are the pursuit by the National Park Service of a Federal reserve water right in the Black Canyon of the Gunnison National Monument and the development of a contract with several Federal agencies and the State of Colorado to deliver water through the Monument and in the Gunnison River Gorge. These activities are not expected to conflict with the Aspinall biological opinion or delay the opinion or flow protection in the Gunnison River.

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

3.7 DOLORS 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 are currently 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 this 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 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.

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.

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)							
I.A.	<u>Green River above Duchesne River</u> (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.	Complete						
I.A.1.b.	Winter/spring.		X	X	X	9/97		
I.A.1.c.	Review summer/fall flow recommendation.					9/97		
I.A.2.	State acceptance of initial flow recommendations.							
I.A.2.a.	Summer/Fall.	Complete, but may be revised based on new information						
I.A.2.b.	Winter/Spring.							
I.A.2.b.(1)	Review scientific basis.					X	12/97	
I.A.2.b.(2)	Assess legal and physical availability of water.					X	12/97	
I.A.3.	Deliver identified flows.							
> I.A.3.a.	Operate Flaming Gorge pursuant to the Biological Opinion to provide summer and fall flows.	Begin 93, ongoing	X	X	X	X	X	X
> I.A.3.b.	Operate Flaming Gorge to supply winter and spring test flows for research.	ongoing through 9/97	X	X	X	X		
> I.A.3.c.	Operate Flaming Gorge Dam to provide winter and spring flows and revised summer/fall flows, if necessary.	begin 10/97, ongoing				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.		X					
I.A.4.a.(2)	Adopt and implement new policy (new appropriations subject to flow criteria).		X					
> I.A.4.a.(3)	Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.			11/94				

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
>	I.A.4.b. Protect Winter/Spring flows.					9/97		
	I.A.4.b.(1) Hold public meeting to establish future appropriation policy.				X	X		
	I.A.4.b.(2) Adopt and implement new policy (new appropriations subject to flow criteria).				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.						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.		X	X	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.					X	12/97	
	I.B.2.b. Assess legal and physical availability of water.					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.							
	I.B.3.b. Adopt and implement new policy (new appropriations subject to flow criteria).				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.				X	X		
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)						X	
	II.A. Restore and manage flooded bottomland habitat.							
	II.A.1. Conduct restoration at 2 sites.							
	II.A.1.a. Old Charlie Wash.							
	II.A.1.a.(1) Develop management plan.		X	12/94				
>	II.A.1.a.(2) Implement restoration/construction actions.				X	X	4/98	
	II.A.1.a.(3) Monitor and evaluate success.		X	X			X	X
	II.A.1.b. Escalante.							
	II.A.1.b.(1) Gain access (lease, purchase, etc.).		9/94					

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
II.A.1.b.(2)	Develop management plan.		X	12/94				
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.				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.		X	X				
II.D.	Support actions to reduce or eliminate contaminant impacts at Ashley Creek and Stewart Drain. ¹		X	X	X	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 and seek Program acceptance.		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.							
V.A.2.	Identify additional razorback sucker spawning areas in lower Green.							
V.A.3.	Assess need for recovery activities in the Price and San Rafael rivers.					X	X	
V.A.4.	Investigate Gila spp. distributions and abundance throughout Whirlpool and Lower Lodore canyons.							
V.A.5.	Determine distribution and habitat use of larval, yearling, and juvenile endangered fishes.							

¹ Contaminants work (in all reaches) will be funded outside of the Recovery Program.

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
I.	PROVIDE AND PROTECT INSTREAM FLOWS HABITAT MANAGEMENT							
I.A.	<u>Yampa River above the Little Snake River</u>							
I.A.1.	Initially identify year-round flows needed for recovery.							
I.A.2.	State acceptance of initial flow recommendations (dependent on development of initial flow recommendation).							
I.A.2.a.	Review scientific basis.			12/94				
I.A.2.b.	Assess legal and physical availability of water.			12/94				
I.A.2.c.	Assess compact considerations.			12/94				
I.A.3.	Legally protect identified flows.							
> I.A.3.a.	CWCB action to implement interim flow protection (preliminary notice).				11/95			
> I.A.3.b.	Acquire.							
I.A.3.b.(1)	Steamboat Lake.							
I.A.3.b.(1)(a)	Change decree.		X					
I.A.3.b.(1)(b)	Lease 2,000 af.	Ongoing	6/94	X	X	X	X	
I.A.3.b.(2)	Juniper conditional decree(s).							
I.A.3.b.(2)(a)	Complete Phase II Feasibility Study.		9/94					
I.A.3.b.(2)(b)	Complete administrative process.			9/95				
> I.A.3.c.	Appropriate.							
I.A.3.c.(1)	CWCB action to implement interim flow protection (preliminary notice).				11/95			
I.A.4.	Review initial recommendations and legal protection.	Every 5 years						X
I.B.	<u>Yampa River below Little Snake River</u>							
I.B.1.	Initially identify year-round flows needed for recovery.	Complete						
I.B.1.a.	Modify based on revisions to environmental baseline.		2/94					
I.B.2.	State acceptance of initial flow recommendations.							
I.B.2.a.	Review scientific basis.			12/94				
I.B.2.b.	Assess legal and physical availability of water.			12/94				

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
	I.B.2.c. Assess compact considerations.			12/94				
	I.B.3. Legally protect identified flows.							
>	I.B.3.a. CWCB action to implement interim flow protection (preliminary notice).				11/95			
>	I.B.3.b. Acquire.							
	I.B.3.b.(1) Assess, acquire and convert water rights to instream flows.							
	I.B.3.b.(2) (See upstream reaches.)							
>	I.B.3.c. Appropriate.							
	I.B.3.c.(1) CWCB filing.				12/95			
	I.B.4. Review initial recommendations and legal protection.	Every 5 years						
	I.C. <u>Little Snake River</u> (Colorado and Wyoming)							
	I.C.1 Determine if habitat exists to protect under Colorado's instream flow program.			6/95				
	I.C.2. Initially identify year-round flows needed for recovery (needed).							
	I.C.2.a. Develop work plan.				10/95			
	I.C.2.b. Identify flows.				X	X	12/97	
	I.C.3. State acceptance of initial flow recommendations (dependent on development of initial flow recommendations).							
	I.C.3.a. Review scientific basis.					6/97		
	I.C.3.b. Assess legal and physical availability of water.					6/97		
	I.C.3.c. Assess compact considerations.						10/97	
	I.C.4. Legally protect identified flows (dependent on development of initial flow recommendations).							
>	I.C.4.a. CWCB action to implement interim flow protection (preliminary notice).						10/97	
	I.C.5. Review initial recommendations and legal protection.	Every 5 years						
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)							
II.A.	Restore native fish passage at instream barriers.							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
II.A.1.	Assess and make recommendations for fish passage at low flows at agricultural diversions.		X	X				
> II.A.2.	Implement viable options to restore fish passage.			X	X	X	X	
II.A.3.	Monitor and evaluate success.							99-00
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 impacts of northern pike on native fishes in the Yampa River.	NPS/CDOW	X					
III.B.	Reduce negative impacts to endangered fishes from sportfish management activities.							
III.B.1.	Identify potential conflicts between present fisheries management in Elkhead Reservoir and endangered fishes and formulate alternative management plan.				12/95			
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.	Evaluate importance of Little Snake River to endangered fishes and develop management action plan (in coordination with development of work plan).					X	X	

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
I.	PROVIDE AND PROTECT INSTREAM FLOWS HABITAT MANAGEMENT							
I.A.	Identify initial year-round flows needed for recovery.		1/94					
I.A.1.	Monitor flows and endangered fish habitat.		X	X				
I.A.2.	Evaluate options to provide flows in lower Duchesne River.		X	X				
I.A.3.	Request/receive test flows to verify fish habitat requirements (e.g. from Starvation Reservoir).			X				
I.B.	State acceptance of initial flow recommendations (dependent on development of initial flow recommendations).							
I.B.1.	Review scientific basis.					X		
I.B.2.	Assess legal and physical availability of water.					X		
> I.C.	Acquire and deliver identified flows.							
I.D.	Legally protect identified flows.							
I.D.1.	Hold public meeting to establish future appropriation policy.					X		
I.D.2.	Adopt and implement new policy (new appropriations subject to flow criteria).					X		
> I.D.3.	Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.						X	
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)							
II.B.	Restore native fish passage at instream barriers.							
II.B.1.	Assess and make recommendations for fish passage at agricultural diversions.		X	X	X	X		
II.C.	Support actions to reduce or eliminate contaminant impacts on the lower Duchesne.		X	X	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 source of nonnative fishes (especially smallmouth bass and black crappie).			X	X			

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
III.A.2.	Assess options to prevent escapement into and to remove smallmouth bass and black crappie from the Duchesne River to benefit Colorado squawfish and razorback sucker young-of-the-year.					X		

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	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.		X					
I.A.2.	Identify flows.			X	X	X		
I.B.	State acceptance of initial flow recommendations (dependent on development of initial flow recommendations).							
I.B.1.	Review scientific basis.					X		
I.B.2.	Assess legal and physical availability of water.					X		
I.B.3.	Assess compact considerations (in Colorado).					X		
I.C.	Legally protect identified flows (dependent on development of initial flow recommendations).							
I.C.1.	Protect flows in Colorado.							
> I.C.1.a.	CWCB action to implement interim flow protection (preliminary notice).						X	
I.C.1.b.	Evaluate options to protect flows.					X		
> I.C.1.c.	Implement and protect.						X	
I.C.2.	Protect flows in Utah.							
1.C.2.a.	Hold public meeting to establish future appropriation policy.					X		
1.C.2.b.	Adopt and implement new policy (new appropriations subject to flow criteria).					X	X	
> 1.C.2.c.	Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.						X	
I.D.	Review initial recommendations and legal protection in Colorado	Every 5 years						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.				12/95			
II.B.	Support actions to reduce or eliminate contaminant impacts of petroleum derivatives.							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	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.	Monitor escapement of nonnative fishes from Kenney Reservoir (especially black crappie and channel catfish).		12/93					
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.			9/95				
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.		X					
V.A.1.	Determine relative abundance and fate of Colorado squawfish congregation below Kenney Reservoir.		12/93					
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.		12/93					
V.A.3.	Develop management action plan.		12/93					

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
I.	PROVIDE AND PROTECT INSTREAM FLOWS HABITAT MANAGEMENT							
I.A.	<u>Colorado River above Gunnison River</u>							
I.A.1.	Initially identify year-round flows needed for recovery.							
I.A.1.a.	Rifle to Roller Dam.		X	X	9/96			
I.A.1.b.	Roller Dam to 15-Mile Reach.		X	X	9/96			
I.A.1.c.	15-Mile Reach.	Complete						
I.A.2.	State acceptance of initial flow recommendations.							
I.A.2.a.	Rifle to Roller Dam (Dependent on initial flow recommendations).							
I.A.2.a.(1)	Review scientific basis.					X		
I.A.2.a.(2)	Assess legal and physical availability of water.		X	X	X			
I.A.2.a.(3)	Assess compact considerations.					X		
> I.A.2.a.(4)	CWCB action to implement flow protection (preliminary notice).					X		
I.A.2.b.	Roller Dam to 15-Mile Reach (Dependent on initial flow recommendations).							
I.A.2.b.(1)	Review scientific basis.					X		
I.A.2.b.(2)	Assess legal and physical availability of water.		X	X	X			
I.A.2.b.(3)	Assess compact considerations.					X		
> I.A.2.b.(4)	CWCB action to implement flow protection (preliminary notice).					X		
I.A.2.c.	15-Mile Reach.							
I.A.2.c.(1)	July - September.							
I.A.2.c.(1)(a)	Review scientific basis.	complete						
I.A.2.c.(1)(b)	Assess legal and physical availability of water.							
I.A.2.c.(1)(b)i)	581 cfs.	complete						
I.A.2.c.(1)(b)ii)	For flows up to flow recommendation.		9/94					
I.A.2.c.(1)(c)	Assess compact considerations.							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
	I.A.2.c.(1)(cii)	581 cfs.	complete					
	I.A.2.c.(1)(ciii)	For flows up to flow recommendation.	9/94					
>	I.A.2.c.(1)(d)	CWCB action to implement flow protection (preliminary notice) for flows up to flow recommendation.	9/94					
	I.A.2.c.(2)	October - June.						
	I.A.2.c.(2)(a)	Review scientific basis.	8/94					
	I.A.2.c.(2)(b)	Assess legal and physical availability of water.		11/94				
	I.A.2.c.(2)(c)	Assess compact considerations.		11/94				
>	I.A.2.c.(2)(d)	CWCB action to implement flow protection (preliminary notice).		1/95				
	I.A.2.c.(3)	Irrigation season return flows.						
	I.A.2.c.(3)(a)	Review scientific basis.	complete					
	I.A.2.c.(3)(b)	Assess physical and legal availability.	4/94					
	I.A.2.c.(3)(c)	Assess compact considerations.	6/94					
>	I.A.2.c.(3)(d)	CWCB action to implement flow protection (preliminary notice).	9/94					
	I.A.2.c.(4)	Non-irrigation season hydropower return flows (Orchard Mesa).						
	I.A.2.c.(4)(a)	Review scientific basis.	2/94					
	I.A.2.c.(4)(b)	Assess physical and legal availability.	2/94					
	I.A.2.c.(4)(c)	Assess compact considerations.	6/94					
>	I.A.2.c.(4)(d)	CWCB action to implement flow protection (preliminary notice).	9/94					
	I.A.3.	Legally protect identified instream flows.						
	I.A.3.a.	Rifle to Roller Dam.						
>	I.A.3.a.(1)	Acquire (see 15-Mile Reach).						
	I.A.3.a.(2)	Appropriate.						
>	I.A.3.a.(2)(a)	CWCB action to implement interim flow protection (filing).					12/97	
>	I.A.3.a.(3)	Deliver (see 15-Mile Reach).						

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
	I.A.3.b. Roller Dam to 15 Mile Reach (concurrent with Rifle to Roller Dam activities, also dependent on flow recommendation).							
>	I.A.3.b.(1) Acquire (see 15-Mile Reach).							
	I.A.3.b.(2) Appropriate.							
>	I.A.3.b.(2)(a) CWCB action to implement interim flow protection (filing).						12/97	
>	I.A.3.b.(3) Deliver (see 15-Mile Reach).							
	I.A.3.c. 15-Mile Reach.							
	I.A.3.c.(1) Acquire.							
	I.A.3.c.(1)(a) Assess, acquire and convert water rights to instream flows (process may be repeated).	Ongoing until flow rec. achieved						
	I.A.3.c.(1)(b) Ruedi.							
>	I.A.3.c.(1)(b)i) Continue year-to-year lease of 10,000 af from Ruedi Resv.	ongoing until 12/95 agreement						
	I.A.3.c.(1)(b)ii) Evaluate options for use of uncommitted Ruedi Reservoir water following Round II sales.			12/94				
>	I.A.3.c.(1)(b)iii) Enter into agreement for uncommitted water which would replace the 10,000 af under the year-to-year lease.				12/95			
	I.A.3.c.(2) Initially Appropriate.							
	I.A.3.c.(2)(a) July - September.							
	I.A.3.c.(2)(a)i) 581 cfs.							
>	I.A.3.c.(2)(a)ia) CWCB filing.	complete						
	I.A.3.c.(2)(a)ii) For flows up to flow recommendation.							
>	I.A.3.c.(2)(a)ii)a) CWCB filing.			12/94				
	I.A.3.c.(2)(b) October - June.							
>	I.A.3.c.(2)(b)i) CWCB filing.			12/94				
	I.A.3.c.(2)(c) Irrigation season return flows.							
>	I.A.3.c.(2)(c)i) CWCB filing.			12/94				
	I.A.3.c.(2)(d) Non-irrigation season hydropower return flows (Orchard Mesa).							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
>	I.A.3.c.(2)(d)i) CWCB filing.			12/94				
	I.A.3.c.(3) Deliver.							
>	I.A.3.c.(3)(a) Pursuant to Ruedi Biological Opinion, deliver 5,000af annually & an additional 5,000af 4 out of 5 years (ongoing and protect by agreement).	ongoing						
	I.A.3.c.(3)(b) Pursuant to Wolford Mountain (Muddy Creek) Biological Opinion, deliver water (dependent on reservoir construction and Program success in obtaining water from other sources).						X	
	I.A.3.c.(3)(c) Coordinated reservoir operations.							
	I.A.3.c.(3)(c)i) Evaluate.		X	X	6/96			
>	I.A.3.c.(3)(c)ii) Implement & protect.				X	X	X	X
	I.A.3.c.(3)(d) Collbran Project.							
	I.A.3.c.(3)(d)i) Evaluate.		9/94					
	I.A.3.c.(3)(d)ii) Implement & protect.							
	I.A.3.c.(3)(d)ii)a) File for change in use to include instream flows.		12/93					
>	I.A.3.c.(3)(d)ii)b) Enter contract.	litigation dependent		9/95				
	I.A.3.c.(3)(e) Silt Project.							
	I.A.3.c.(3)(e)i) Evaluate.		9/94					
	I.A.3.c.(3)(e)ii) Implement & protect.							
	I.A.3.c.(3)(e)ii)a) File for change in use to include instream flows.			12/94				
>	I.A.3.c.(3)(e)ii)c) Enter contract.	litigation dependent		9/95				
	I.A.3.c.(3)(f) Grand Valley Water Management Project.							
	I.A.3.c.(3)(f)i) Evaluate.		X	X	9/96			
>	I.A.3.c.(3)(f)ii) Protect.				X	9/97		
>	I.A.3.c.(3)(f)iii) Construct and implement.	Begin 4/98 using check structures, complete 9/98					9/98	
	I.A.4. Review initial flow recommendations and legal protection.	Every 5 years						
	I.A.4.a. Rifle to Roller Dam.							X
	I.A.4.b. Roller Dam to 15-Mile Reach (see Rifle to Roller Dam).							X

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
	I.A.4.c. 15-Mile Reach.							X
	I.B. <u>Colorado River from the Gunnison to the Colorado-Utah State line</u> (Includes the 18-Mile Reach (Flow recommendation needed; expected with completion of Aspinall Unit biological opinion.)							
	I.B.1. Initially identify year-round flows needed for recovery.		X	X	X	9/97		
	I.B.2. State acceptance of initial flow recommendations.							
	I.B.2.a. Review scientific basis.					X	12/97	
	I.B.2.b. Assess legal and physical availability of water.				X	X	12/97	
	I.B.2.c. Assess compact considerations.				X	X	12/97	
>	I.B.2.d. CWCB action to implement interim flow protection (preliminary notice).						7/98	
	I.B.3. Legally protect identified flows.							
>	I.B.3.a. Acquire (see Colorado River above Gunnison and Gunnison River).							
	I.B.3.b. Appropriate.							
>	I.B.3.b.(1) CWCB filing.							12/98
	I.B.3.c. Deliver and legally protect flows from Aspinall (see Colorado River above Gunnison and Gunnison River).					9/97		
>	I.B.3.c.(1) Operate Aspinall to provide test flows.							
>	I.B.3.c.(2) Operate Aspinall to provide flows pursuant to biological opinion.							
	I.B.4. Review initial recommendations and legal protection.	Every 5 years						
	I.C. <u>Colorado River from Colorado-Utah State line to Green River</u> (Flow recommendations needed.)							
	I.C.1. Initially identify year-round flows needed for recovery.		X	X	X	9/97		
	I.C.2. State acceptance of initial flow recommendations.							
	I.C.2.a. Review scientific basis.					X	12/97	
	I.C.2.b. Assess legal and physical availability of water.						12/97	
	I.C.3. Legally protect identified flows.							
	I.C.3.a. Hold public meeting to establish future appropriation policy.							X

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
I.C.3.b.	Adopt and implement new policy (new appropriations subject to flow criteria).							X
I.C.3.c.	Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.							X
I.D.	<u>Colorado River below Green River</u>							
I.D.1.	Initially identify year-round flows needed for recovery.							X
I.D.2.	State acceptance of initial flow recommendations (dependent on development of initial flow recommendations).							
I.D.2.a.	Review scientific basis.							X
I.D.2.b.	Assess legal and physical availability of water.							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.							X
I.D.3.b.	Adopt and implement new policy (new appropriations subject to flow criteria).							X
I.D.3.c.	Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.							X
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)							
II.A.	Restore and manage flooded bottomland habitat.							
II.A.1.	Conduct restoration at 2 sites (30 Road and Scott Matheson Wildlife Refuge [Moab Slough]).							
II.A.1.a.	Gain access (lease, purchase, etc.) for 30 Road site.			3/95				
II.A.1.b.	Develop management plans.		9/94					
> II.A.1.c.	Implement restoration/construction actions.				X	X	4/98	
II.A.1.d.	Monitor and evaluate success.						X	X
II.B.	Restore native fish passage at instream barriers.							
> II.B.1.	Restore passage at Price Stubb.				9/96			
II.B.1.a.	Assess and make recommendations for fish passage.		9/94					
II.B.2.	Restore Passage at Government Highline (Roller Dam).							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
II.B.2.a.	Assess and make recommendations for fish passage.	Dep. on R&B loan		9/95				
II.B.3.	Restore Passage at Grand Valley Diversion (Palisade).							
II.B.3.a.	Assess and make recommendations for fish passage.		9/94					
II.C.	Support actions to reduce or eliminate contaminant impacts of heavy metals and selenium in the Grand Valley.		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.	Evaluate angling mortality in the Grand Valley, at Black Rocks and Westwater.			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 and seek Program acceptance.							
> IV.A.1.b.	Implement experimental augmentation plan.							
IV.A.1.b.(1)	Produce fish.		X					
IV.A.1.b.(2)	Stock fish.		X					
IV.A.1.b.(3)	Monitor and evaluate results; develop revised augmentation plan.		X	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.			12/94				
IV.A.2.a.	Seek Program acceptance of augmentation plan.			6/95				
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		X	X	X	X	

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
I.	PROVIDE AND PROTECT INSTREAM FLOWS HABITAT MANAGEMENT							
I.A.	Initially identify year-round flows needed for recovery (Flow recommendations will be provided upon completion of Aspinall Unit studies.)					9/97		
I.B.	State acceptance of initial flow recommendations (Flow recommendations will be provided upon completion of Aspinall Unit studies.)							
I.B.1.	Review scientific basis.						12/97	
I.B.2.	Assess legal and physical availability of water.					X	12/97	
I.B.3.	Assess compact considerations.						12/97	
> I.B.4.	CWCB action to implement interim flow protection (preliminary notice).						6/98	
I.C.	Legally protect identified flows.							
> I.C.1.	Acquire (flow recommendations will be provided upon completion of Aspinall Unit studies.)				X	X	X	
I.C.1.a.	Assess, acquire and convert water rights to instream flows.							
> I.C.2.	Appropriate (flow recommendations will be provided upon completion of Aspinall Unit studies.)				9/96			
I.C.3.	CWCB filing.							12/98
I.C.4.	Deliver.							
> I.C.4.a.	Aspinall Unit supplemental releases to maintain 2,000 cfs minimum flow at Colorado-Utah state line 9 out of 10 years.	ongoing through 6/97	X	X	X	9/97		
I.C.4.b.	Flows from Aspinall Unit for research studies.		X	X	X	X		
> I.C.4.b.(1)	Deliver flows.		X	X	X	9/97		
> I.C.4.b.(2)	Protect research flows.		4/94					
I.C.4.c.	Flows from Paonia Reservoir in accordance with Biological Opinion and protect by water right change.							
> I.C.4.c.(1)	Deliver flows.	ongoing						
I.C.4.d.	Flows from Aspinall Unit pursuant to Aspinall Biological Opinion.							
I.C.4.d.(1)	Determine if change in water right is needed.		9/94					

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
	I.C.4.d.(2) File to change water right to include instream flow use.			12/94				
	I.C.4.d.(3) Change water right to include instream flow use						12/97	
>	I.C.4.d.(4) Deliver flows.	Begin 10/97, ongoing					10/97	X
	I.D. Review initial recommendations and legal protection.	every 5 years						
	II. RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)							
	II.A. Restore and manage flooded bottomland habitat.							
	II.A.1. Conduct restoration at Escalante State Wildlife Area.			X	X	X	X	
	II.A.1.a. Gain access (lease, purchase, etc.).			9/95				
	II.A.1.b. Develop management plan.		X	12/94				
>	II.A.1.c. Implement restoration/construction actions.					X	4/98	
	II.A.1.d. Monitor and evaluate success.	Through 00					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.		9/94					
	II.B.1.b. Implement viable options to restore fish passage.							
>	II.B.1.b.(1) Construct fish ladder.			X	9/96			
	II.B.1.c. Operate and maintain fish ladder.	ongoing			X	X	X	X
	II.B.1.d. Monitor and evaluate success.	Through 99			X	X	X	99
	II.B.2. Restore passage at Hartland.							
	II.B.2.a. Assess and make recommendations for fish passage.			9/95				
	II.C. Support actions to reduce or eliminate contaminant impacts (especially selenium).		X	X	X	X	X	
	III. REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)							
	III.B. Reduce negative impacts to endangered fishes from sportfish management activities.							
	III.B.1.a. Evaluate angling mortality on endangered fishes below Redlands.			X	X			

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
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 and seek Program acceptance.							
> IV.A.1.b.	Implement experimental augmentation plan.							
IV.A.1.b.(1)	Produce fish.		X					
IV.A.1.b.(2)	Stock fish.		X					
IV.A.1.b.(3)	Monitor and evaluate results.		X	X	X			
IV.A.1.c.	Develop augmentation/restoration plan for razorback sucker and seek Program acceptance.				12/95			
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.							
V.A.2.	Identify additional spawning sites of endangered fishes on the Gunnison River.		X					
V.A.3.	Evaluate effects of reservoir reoperation on Colorado squawfish reproductive success via larval sampling.					X	X	end 99
V.A.4.	Evaluate habitat relationships to reoperated flows.					X	X	end 99

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	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 options to control nonnative fish escapement from McPhee Reservoir.							
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.				12/95			

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
I.	PROVIDE AND PROTECT INSTREAM FLOWS HABITAT MANAGEMENT							
I.B.	Evaluate methods for defining habitat-flow needs and select methods most appropriate to specific stream reaches.							
I.B.1.	Review instream flow methodologies and assess the technical adequacy of current flow recommendations.		3/94					
I.B.2.	Develop process for integrating geomorphology and food web studies into flow recommendations.		9/94					
I.C.	Develop and select methods for interim protection of instream flows in Colorado.		X	1/95				
I.C.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.C.1.a.	Colorado Attorney General review.		11/93					
I.C.1.b.	CWCB approval/recommended action.		1/94					
I.C.1.c.	Adopt legislation or regulation, if necessary.		9/94					
I.C.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.	Ongoing		1/95				
I.C.3.	Assess need for retirement of senior conditional water rights.				1/96			
> I.D.	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.D.1.	Colorado.							
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)							
II.A.	Conduct inventory of flooded bottomland habitat for potential restoration.		9/94					
II.B.	Support actions to reduce or eliminate contaminant impacts.							
II.B.1.	Evaluate effects of petroleum derivatives, heavy metals, uranium, agriculture, and municipal, industrial, and carrier sources of potential contaminants throughout the Upper Basin.							
II.B.2.	Evaluate and correct pipelines that threaten endangered fishes throughout the Upper Basin.							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	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.	Where not already generally known, identify negative impacts (e.g., predation, competition) of problem species.		X	6/95				
III.A.2.	Assess options (including selective removal) to reduce negative impacts of problem species and assess regulations and options (including harvest) to reduce negative impacts on native fishes from nonnative sportfish and options to reduce angling mortality on native fishes.			X	12/95			
> III.A.3.	Implement viable options.		X	X	X	X	X	X
III.B.	Reduce negative impacts to endangered fishes from sportfish management activities.							
III.B.1.	Implementation Committee approval of Nonnative Fish Stocking Procedures.		1/94					
III.B.2.	Confine stocking of nonnative fishes to areas where the absence of potential conflict with endangered fishes can be demonstrated.	94-ongoing	X	X	X	X	X	X
III.B.3.	Regulate private land stocking and commercial aquaculture industry.			12/94				
III.B.3.a.	Colorado.							
III.B.3.b.	Utah.							
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.		2/94					
IV.A.2.	Develop and implement Genetics Management Plan for all species and genetic stocks and update by December of each year.	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.			12/94				
IV.A.3.b.	Bonytail and humpback chubs.							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
	IV.A.3.b.(1) Morphological and allozyme analyses.		9/94					
	IV.A.3.b.(2) Mitochondrial DNA analysis.					9/97		
	IV.A.3.c. Colorado squawfish.		9/94					
>	IV.A.4. Secure and manage the following presumptive genetic stocks in refugia (according to the Genetics Management Plan) (subject to change based on results of genetic stock identification studies).							
	IV.A.4.a. Razorback sucker.							
	IV.A.4.a.(2) Upper Green (including Island Park, Echo Park ² , etc.).		X					
	IV.A.4.a.(3) Colorado River arm of Lake Powell.	complete						
	IV.A.4.a.(4) Upper Colorado River above Westwater.	complete						
	IV.A.4.b. Bonytail chub.							
	IV.A.4.b.(1) Lake Mojave.	complete						
	IV.A.4.c. Humpback chub.							
	IV.A.4.c.(1) Black Rocks Canyon.		X					
	IV.A.4.c.(2) Westwater Canyon.			X				
	IV.A.4.d. Colorado squawfish.							
	IV.A.4.d.(1) Upper Colorado River above Westwater Canyon.	complete						
	IV.A.5. Develop basinwide bonytail chub restoration plan and seek Program acceptance.		X	X				
	IV.B. Conduct annual fish propagation activities.							
	IV.B.1. Identify fish needs for genetic stock refugia, research, augmentation, and information and education.	annual	12/93	12/94	12/95	12/96	12/97	X
	IV.B.2. Produce Annual Propagation Operational Plan.	annual	12/93	12/94	12/95	12/96	12/97	X
	IV.C. Operate and maintain facilities.	ongoing	X	X	X	X	X	X
	IV.C.1. Ouray.							
	IV.C.2. Horsethief.							
	IV.C.3. Bellvue.							
	IV.C.4. Wray.							

² It has not yet been determined if razorback suckers in the Yampa and Green rivers should be considered separate genetic stocks

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
IV.D.	Conduct independent review of Program endangered fish facilities and operations.		X					
IV.E.	Plan, design, and construct needed facilities.							
IV.E.1.	Develop Coordinated Hatchery Facility Plan to meet long- and short-term fish needs.		2/94					
IV.E.2.	Design and construct appropriate facilities.		X	X	X	X	X	
IV.E.2.a.	Ourray expansion.		X	X				
V.	MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT)							
V.A.	Measure and document population and habitat parameters to determine status and biological response to recovery actions.							
V.A.1.	Conduct standardized monitoring program.	annual	X	X	X	X	X	X
V.A.1.a.	Evaluate and refine procedures periodically, as appropriate. (Biology Committee.)		X	X	X	X	X	X
V.A.1.b.	Identify and evaluate new methodologies for monitoring population parameters such as population size, survival, natality (births) and mortality (deaths) that identify population recovery and maintenance of natural reproduction.		X	X	X	X	X	X
V.A.2.	Develop a habitat monitoring program and evaluate results from annual channel monitoring program (Biology Committee).							
V.A.3.	Annually assess and report changes in habitat and population parameters using data gathered in these monitoring programs (IMO process) (Biology Committee).							
V.A.4.	Conduct interagency data management program to compile, manage, and maintain all research and monitoring data collected by the Recovery Program.	annual	X	X	X	X	X	X
V.B.	Conduct research to acquire needed life history information.							
V.B.1.	Identify significant deficiencies in life history information and needed research.		X					
V.B.2.	Conduct appropriate studies to provide needed life history information.							
V.B.2.a.	Conduct chemoreception-imprinting studies.	through 00	X	X	X	X	X	X
V.B.2.b.	Conduct <u>Gila</u> and razorback sucker life history studies.	through 99	X	X	X	X	X	X
V.C.	Develop and enhance scientific techniques required to complete recovery actions.							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
V.C.1.	Conduct marking study of young-of-the-year Colorado squawfish.	complete						
V.D.	Establish sampling procedures to minimize adverse impacts to endangered fishes.							
V.D.1.	Assess electrofishing injury impacts to endangered fishes.		X	X				
V.D.2.	Implement scientific sampling protocols to minimize mortality for all endangered fishes.	ongoing	X	X	X	X	X	X
VI.	INCREASE PUBLIC AWARENESS AND SUPPORT FOR THE ENDANGERED FISHES AND THE RECOVERY PROGRAM.							
VI.A.	Conduct survey to measure public awareness of and attitudes toward endangered Colorado River fishes and the Recovery Program.	periodic	X		X	X		
VI.B.	Train Recovery Program managers and researchers in media relations.		X					
VI.C.	Plan and implement information and education activities in specific locations where significant Recovery Program actions are being taken (e.g site-specific news releases, presentations, and public meetings).	ongoing	X	X	X	X	X	X
VI.D.	Promote technical publication of study results.	ongoing	X	X	X	X	X	X
VI.E.	Produce, distribute, and evaluate information and education products.	ongoing	X	X	X	X	X	X
VI.E.1.	Produce and distribute newsletter.	Twice each year	X	X	X	X	X	X
VI.E.2.	Write and disseminate news releases.	~5-10/year	X	X	X	X	X	X
VI.E.3.	Produce and distribute brochure.	Reprinted in 93, distribution ongoing	X	X	X	X	X	X
VI.E.4.	Produce and distribute information card for field officers to use with anglers.	Production complete, distribution ongoing	X	X	X	X	X	X
VI.E.5.	Identify endangered fishes in fishing regulations (and on fishing licenses, where feasible).	ongoing	X	X	X	X	X	X
VI.E.6.	Design and oversee production of signs to alert and inform anglers about endangered fishes.	ongoing	X	X	X	X	X	X
VI.E.7.	Produce and promote video for televised airing.	Revise and distribute in 93						
VI.E.8.	Produce and distribute slide program.	Revise and distribute in 93						
VI.E.9.	Compile data for, write, and disseminate historical research about the endangered fishes.							

	ACTIVITY	STATUS	FY94 10/93-9/94	FY95 10/94-9/95	FY96 10/95-9/96	FY97 10/96-9/97	FY 98 10/97-9/98	OUT YEAR
VI.E.10.	Produce and distribute poster on endangered fishes.	Production complete in 90, distribution ongoing	X	X	X	X	X	X
VI.E.11.	Create and distribute portable display(s).	Production to be completed in 93, distribution ongoing	X	X	X	X	X	X
VI.E.12.	Produce permanent display(s).	Proposed beginning in 94	X					
VI.E.13.	Organize and conduct education for river guides.							
VI.E.14.	Conduct public presentations and meetings.	ongoing	X	X	X	X	X	X
VI.E.15.	Establish Recovery Program technical library and announce availability of research information clearinghouse.		X					
VI.E.16.	Develop distribution plans for appropriate I&E products.	Due on completion of each product	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.	annual	X	X	X	X	X	X
VII.A.2.	Develop Interim Management Objective (IMOs) periodically for each species and presumptive stock and an index to population status.	Update every 5 years	X	X				
VII.A.3.	Monitor and assess Recovery Program accomplishments annually. (The Biology Committee will use IMOs to gauge biological response to recovery actions Biological response of target populations or stocks of endangered fishes to specific recovery actions will be used to gauge progress within the Recovery Implementation Program.)	annual	X	X	X	X	X	X
VII.A.4.	Develop annual work plan to address priority needs.	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).	ongoing	X	X	X	X	X	
VII.C.	Manage, direct, and coordinate Recovery Program activities.	ongoing	X	X	X	X	X	X
VII.C.1.	Review Information and Education program (Management Committee).		3/94					

5.0 RECOVERY ACTION PLAN BUDGET PROJECTIONS (ALL FIGURES x 1000)

ACTIVITY	SUBBASIN	RECOVERY ELEMENT	FY-94				FY-95				FY-96				FY-97				FY-98				OUTYEARS									
			ANNUAL	CAP*TL	S7/WAC	O&M	OUTSD	ANNUAL	CAP*TL	S7/WAC	O&M	OUTSD	ANNUAL	CAP*TL	S7/WAC	O&M	OUTSD	ANNUAL	CAP*TL	S7/WAC	O&M	OUTSD	ANNUAL	CAP*TL	S7/WAC	O&M	OUTSD					
ID CR FLOWS (FG)	GR-M,GR-D	HMG,HMD,STK,RMD	418.7							37.0	450.0					400.0						0.0					0.0	0.0				
UT WATER CONTRACTS	GR-M,GR-W,GR-D,CR-M	HMG																														
RESTORE FLOODPLAINS	GR-M,CR-M,CR-G,GEN	HMD	104.6	1772.0							22.2	2368.0			8.0	2355.0						2355.0					2355.0					
RESTORE PASSAGE	GR(ALL),CR-M,CR-G	HMD		256.0								1391.0			0.0	325.0			950.0	20.0		800.0	20.0			1400.0	100.0					
REDUCE CONTAMINANTS	ALL BUT GR-Y	HMD																														
GR RBS AUGHT. PLAN	GR-M	STK																														
RBS SPANNING AREAS	GR-M	RMD																				20.0										
ASSESS PRICE/SAN RAF	GR-M	RMD																				50.0					50.0					
STEAMBOAT H2O LEASE	GR-Y	HMG			32.0																							156.0				
JUNIPER ADMIN. PROC.	GR-Y	HMG																														
ID L. SNAKE FLOWS	GR-Y	HMG									20.0											30.0					30.0					
L. SNAKE MGMT. PLAN	GR-Y	RMD																				50.0					50.0					
NMA: SOURCE, OPTIONS	GR-D	NMA	0.0								10.0											10.0					10.0					
ID WHITE RIVER FLOWS	GR-W	HMG	7.0								20.0											20.0					20.0					
MONITOR CO. R. FLOWS	CR-M	HMG			9.9								10.0																			
COORD. RESV. MGMT.	CR-M	HMG		50.0								300.0										300.0					300.0					
COLLBRAM REOPERATION	CR-M	HMG		30.0								10.0										100.0					100.0					
SILT REOPERATION	CR-M	HMG		110.0																												
GV WATER MANAGEMENT	CR-M	HMG		200.0								350.0										250.0					200.0					
NMA REMOVAL OPTIONS	CR-M	NMA									30.0											30.0					30.0					
Eval. ANGLING MORT	CR-M	NMA									10.0											10.0					10.0					
AUGMENT RAZORBACKS	CR-M,CR-G	STK	50.5																			35.5					16.2					
UPPER CR HABITAT	CR-M	HMG,STK																														
ID FLOWS - ASPINALL	CR-M,CR-G	HMG	390.3								427.3											402.0				173.0						
Eval ANGLING MORT.	CR-G	NMA																				5.0					5.0					
MCPHEE FISH MGMT.	CR-D	NMA																				20.0					20.0					
H2O ACQ. STAFF	GEN	HMG	96.0																			104.0					109.0					
ISF PROT. METHODS	GEN	HMG			10.0																	0.0					0.0					
NMA CONTROL OPTIONS	GEN,GR-D	NMA									42.0																					
GENETICS MGMT.	GEN	STK	44.0																													
GILA TAXONOMY	GEN	STK	193.0								100.0	125.0																150.0				
BONYTAIL REINTRO.	GEN	STK	53.0									50.0																				
PROPAGATION COORD.	GEN	STK	44.0									50.0										50.0					50.0					
HATCHERY O&M	GEN	STK	287.1									47.0		400.0														1700.0				
HATCHERY PLAN, CONST	GEN	STK		200.0							960.0	1000.0																				
STD. MONIT. & RELT'D	GEN,GR-M,CR-M,CR-G	RMD,HMG	329.2								307.1	0.0										313.3					320.0					
NEW MONIT. METHODS	GEN	RMD	20.0																													
HABITAT MONITORING	GEN	RMD,HMG	17.0																													
DATA MANAGEMENT	GEN	RMD	25.8																													
CHEMRECEPTION	GEN, GR-M	RMD,STK	90.2																													
PUBLIC AWAR./SUPPORT	GEN	IAE	87.6								100.0											100.0					100.0					
PROGRAM PARTICIPAT'N	GEN	PMG	309.9								31.0	319.2										328.8					348.9					
PROGRAM MANAGEMENT	GEN	PMG	262.3									270.2										278.3					286.7					
TOTALS:			2873.0	2618.0	51.9	400.0	1175.0	2626.3	5419.0	42.0	450.0	0.0	2353.0	3930.0	42.0	0.0	0.0	2111.6	9305.0	32.0	520.0	0.0	1393.0	8955.0	32.0	570.0	0.0	4400.0	1400.0	156.0	1800.0	0.0

RECOVERY ELEMENTS:

- HMG = I. PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)
- HMD = II. RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)
- NMA = III. REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)
- STK = IV. CONSERVE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES)
- RMD = V. MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT)
- IAE = VI. INCREASE PUBLIC AWARENESS AND SUPPORT FOR THE ENDANGERED FISHES AND THE RECOVERY PROGRAM (INFORMATION AND EDUCATION)
- PMG = VII. PROVIDE PROGRAM PLANNING AND SUPPORT (PROGRAM MANAGEMENT)

SUBBASIN ACTION PLANS:

- GR-M = GREEN RIVER MAINSTEM
- GR-Y = GREEN RIVER: YAMPA AND LITTLE SNAKE RIVERS
- GR-D = GREEN RIVER ACTION PLAN: DUCHESNE RIVER
- GR-W = GREEN RIVER ACTION PLAN: WHITE RIVER
- CR-M = COLORADO RIVER ACTION PLAN: MAINSTEM
- CR-G = COLORADO RIVER ACTION PLAN: GUNNISON RIVER
- CR-D = COLORADO RIVER ACTION PLAN: DOLORES RIVER
- GEN = GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

FUNDING SOURCES:

- ANNUAL = SCHEDULED ANNUAL CONTRIBUTIONS FROM RECOVERY PROGRAM PARTICIPANTS
- CAP*TL = CAPITAL FUNDS FROM CONGRESS
- S7/WAC = FUNDS FROM DEPLETION CHARGES OR FUNDS FROM CONGRESS DESIGNATED FOR WATER ACQUISITION
- O&M = FUNDS DESIGNATED FOR OPERATION AND MAINTENANCE OF FACILITIES
- OUTSD = FUNDS FROM OTHER SOURCES, INCLUDING OTHER-THAN-SCHEDULED CONTRIBUTIONS FROM RECOVERY PROGRAM PARTICIPANTS

BUDGET TOTALS:

	ANNUAL	C/P*TL	S7/WAC	O&M	OUTSD
FY 94:	2873.0	2618.0	51.9	400.0	1175.0
FY 95:	2626.3	5419.0	42.0	450.0	
FY 96:	2353.0	3930.0	42.0		
FY 97:	2111.6	9305.0	32.0	520.0	
FY 98:	1393.0	8955.0	32.0	570.0	
OUTYEARS:	4400.0	1400.0	156.0	1800.0	
	15756.9	31527.0	355.9	3740.0	1175.0

GRAND TOTAL (ROUGH, LOW ESTIMATE) = \$2655.6 (\$52,655,600)

This total does not include costs of: 1) activities which have been identified, but not yet scheduled; or 2) "implementation" activities which have not yet been identified because their feasibility is

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