



Upper Colorado River Endangered Fish Recovery Program

RECOVERY IMPLEMENTATION PROGRAM
SECTION 7 CONSULTATION, SUFFICIENT PROGRESS,
AND HISTORIC PROJECTS AGREEMENT
October 15, 1993 (Revised March 8, 2000)

AND

RECOVERY IMPLEMENTATION PROGRAM
RECOVERY ACTION PLAN
(RIPRAP)
March 25, 2011

PREFACE

This document was originally finalized on October 15, 1993. Part One received a minor revision on March 8, 2000, to accommodate programmatic biological opinions. Part Two has been revised to accommodate annual updates, designation of critical habitat for the endangered fishes, and development of specific recovery goals for each of the species.

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

Sections 4.1.5, 4.1.6, and 5.3.4 of the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) outline procedures for consultation pursuant to Section 7 of the Endangered Species Act on water projects in the Upper Colorado River Basin. The Section 7 Agreement (including Section 7 Consultation, Sufficient Progress, and Historic Projects 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, most current information available and the recovery goals for the four endangered fish species. It identifies specific actions and time frames currently believed to be required to recover the endangered fishes in the most expeditious manner in the Upper Basin. The RIPRAP is the Recovery Program's long range plan. It contains dates for accomplishing specific actions over the next 5 years and beyond. The RIPRAP will serve as a measure of accomplishment so that the Recovery Program can continue to serve as a reasonable and prudent alternative for projects undergoing Section 7 consultation to avoid the likelihood of jeopardy to the continued existence of the endangered fishes as well as to avoid the likely destruction or adverse modification of critical habitat.

PART ONE:

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

Agreement

Section 7 Consultation, Sufficient Progress, and Historic Projects

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

October 15, 1993

Revised March 8, 2000

I. Background

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

II. RIP Recovery Action Plan (RIPRAP)

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

The RIP is intended to provide the reasonable and prudent alternatives for projects undergoing Section 7 consultation in the upper basin. While some recovery actions in the RIPRAP are expected to have more direct or immediate benefits for the endangered fishes than others, all are considered necessary to accomplish the objectives of the RIP. Recovery actions which protect or improve habitat conditions and result in more immediate, positive population responses will be most important in determining the extent to which the RIP provides the reasonable and prudent alternatives for projects undergoing Section 7 consultation. In general, these actions will be given highest priority in the RIPRAP.

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

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

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

III. Framework for Agreement

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

1. Activities and accomplishments under the RIP are intended to provide the reasonable and prudent alternatives which avoid the likelihood of jeopardy to the continued existence of the endangered Colorado River fishes (hereinafter the "reasonable and prudent alternative") resulting from depletion impacts of new projects and all existing or past impacts related to historic projects with the exception of the discharge by historic projects of pollutants such as trace elements, heavy metals, and pesticides. However, where a programmatic biological opinion applies, the appropriate provisions of such an opinion will apply to future individual consultations.

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 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

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

not be required from historic projects which undergo Section 7 consultation in the future.

3. The Bureau of Reclamation (BR) and the Western Area Power Administration will operate projects authorized and funded pursuant to Federal reclamation law consistent with its responsibilities under Section 7 of the ESA and with any existing contracts. No depletion charge will be required on depletions from BR projects as long as BR continues its contributions to the RIP's annual budget.
4. The FWS will assess the impacts of projects that require Section 7 consultation and determine if progress toward recovery has been sufficient for the RIP to serve as a reasonable and prudent alternative. The FWS will use accomplishments under the RIP as its measure of sufficient progress. The FWS will also consider whether the probable success of the RIP is compromised as a result of a specific depletion or the cumulative effect of depletions. Support activities (funding, research, information and education, etc.) in the RIP contribute to sufficient progress to the extent that they help achieve a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction. Generally, sufficient progress will be evaluated separately for the Colorado and Green River subbasins (but not individual tributaries within each subbasin). However, the FWS will give due consideration to progress throughout the upper basin in evaluating sufficient progress.
5. If sufficient progress is being achieved, biological opinions will identify the activities and accomplishments of the RIP that support it serving as a reasonable and prudent alternative.
6. If sufficient progress is not being achieved, biological opinions for new and historic projects will be written to identify which action(s) in the RIPRAP must be completed to avoid jeopardy. Specific recovery actions will be implemented according to the schedule identified in the RIPRAP. The FWS will confer with the Management Committee on the identification of these actions within established timeframes for the Section 7 consultation. For historic projects, these actions will serve as the reasonable and prudent alternative as long as they are completed according to the schedule identified in the RIPRAP. For new projects, these actions will serve as a reasonable and prudent alternative so long as they are completed before the impact of the project occurs. The FWS has ultimate authority and responsibility for determining whether progress is sufficient to enable it to rely upon the RIP as a reasonable and prudent alternative and identifying actions necessary to avoid jeopardy.
7. Certain situations may result in the FWS determining that the recovery action in previously rendered biological opinions are no longer serving as a reasonable and prudent alternative. These situations may include, but are not limited, to:
 - a. Critical deadlines for specified recovery actions are missed;
 - b. Specified recovery actions are determined to be infeasible; and
 - c. Significant new information about the needs or population status of the fishes becomes available;
8. The FWS will notify the Implementation and Management Committees when a situation may result in the RIP not serving as a reasonable and prudent alternative.

The Management Committee will work with the FWS to evaluate the situation and develop the most appropriate response to restore the RIP as a reasonable and prudent alternative (such as adjusting a recovery action so it can be achieved, developing a supplemental recovery action, shortening the timeframe on other recovery actions, etc.).

9. The RIP is responsible for providing flows which the FWS determines are essential to recovery of the endangered fishes. Whether or not a Section 7 review is required, the RIP will work cooperatively with the owners/operators of historic projects on a voluntary basis to implement recovery actions needed to recover the endangered fishes.
10. The responsibility for the efficiency and effectiveness of the RIP, and for its viability as a reasonable and prudent alternative, rests upon RIP participants, not with individual project proponents. RIP participants fully share that responsibility.
11. If the RIP cannot be restored to provide the reasonable and prudent alternative per item 8, above, as a last resort the FWS will develop a reasonable and prudent alternative, if available, with the lead Federal Agency and the project proponent. (RIP participants recognize that such actions would be inconsistent with the intended operation of the RIP). The option of requesting a depletion charge on historic projects or other measures on new or historic projects will only be used in the event that the RIPRAP does not or can not be amended to serve as a reasonable and prudent alternative. In this situation, the reasonable and prudent alternative will be consistent with the intended purpose of the action, within the Federal Agency's legal authority and jurisdiction to implement, and will be economically and technologically feasible.
12. This agreement becomes effective upon adoption of the RIPRAP by the Implementation Committee. Until the RIPRAP is adopted, the FWS will use the procedures in this agreement and the January 1993, draft RIPRAP as the basis for identifying reasonable and prudent alternatives.
13. Experience may dictate a need to modify this agreement in the future. This agreement may be modified or amended by consensus of all the RIP participants. A review of the agreement may be initiated by any voting member of the Implementation Committee.

PART TWO:

RECOVERY IMPLEMENTATION PROGRAM
RECOVERY ACTION PLAN
(RIPRAP)

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

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1.0 INTRODUCTION

1.1 RECOVERY PROGRAM PURPOSE

The purpose of the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin (Recovery Program) is to recover the humpback chub (*Gila cypha*), bonytail (*G. elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), and razorback sucker (*Xyrauchen texanus*) while existing and new water development proceeds in the Upper Basin (i.e., Upper Colorado River Basin upstream of Glen Canyon Dam, excluding the San Juan River; Cooperative Agreement, 1988) in compliance with the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et. seq.*). Further, the Recovery Program is intended to serve as a reasonable and prudent alternative to avoid the likelihood of jeopardy to the continued existence of the endangered fishes and to avoid the likely destruction or adverse modification of critical habitat in Section 7 consultations on depletion impacts related to new projects and all impacts (except the discharge of pollutants such as trace elements, heavy metals, and pesticides) associated with historic water projects in the Upper Basin.

1.2 SPECIES RECOVERY GOALS/PLANS

The overall goal for recovery of the four endangered fishes is to achieve naturally self-sustaining populations and to protect the habitat on which those populations depend. Recovery plans for these species have been developed under Section 4(f) of the Endangered Species Act (ESA; U.S. Fish and Wildlife Service 1990a, 1990b, 1991, 1998), and the final rule determining critical habitat was published in the *Federal Register* on March 21, 1994 (59 FR 13374; Appendix). Final recovery goals for the four endangered fish, which amend and supplement the former recovery plans, were approved in August 2002 (U.S. Fish and Wildlife Service 2002a, 2002b, 2002c, 2002d).

The recovery goals describe what is necessary for downlisting and delisting each of the species by identifying site-specific management actions/tasks necessary to minimize or remove threats; establishing objective, measurable criteria that consider demographic and genetic needs for self-sustaining, viable populations; and providing estimates of the time to achieve recovery. In a lawsuit by Grand Canyon Trust over the humpback chub recovery goals, U.S. District Court 9th Circuit ruled that review of the substance of Service recovery plans is inappropriate under the Administrative Procedure Act and the ESA, but ordered the goals vacated until time and cost estimates are updated. The Service began the process of reviewing and updating the species recovery goals in 2007.

In the context of the recovery goals/plans, recovery of humpback chub, bonytail, and razorback sucker is considered across the Upper and Lower basins (each basin is treated as a "recovery unit"), with separate recovery criteria developed for each of the two recovery units. Recovery of Colorado pikeminnow is considered necessary only for

the Upper Colorado River Basin (including the San Juan River subbasin). The Recovery Program and the San Juan River Basin Recovery Implementation Program provide for the coordinated implementation of management actions/tasks that contribute to recovery in the Upper Basin recovery unit.

1.3 RECOVERY ACTION PLAN PURPOSE

This Recovery Implementation Program Recovery Action Plan (RIPRAP) has been developed using the best, most current information available and the recovery goals for the four endangered fish species. The RIPRAP is intended to provide an operational plan for implementing the Recovery Program, including development of the Recovery Program's annual work plan and future budget needs. Specifically, the RIPRAP identifies the feasible actions that are necessary to recover the endangered fishes, including schedules and budgets for implementing those actions. The RIPRAP also identifies the specific recovery actions that must be accomplished in order for the Recovery Program to serve as a reasonable and prudent alternative to avoid the likelihood of jeopardy to the continued existence of the endangered fishes and to avoid the likely destruction or adverse modification of critical habitat in Section 7 consultations for depletion impacts of new projects and all existing or past impacts related to historic water projects (except impacts from contaminants) in the Upper Basin, in accordance with the October 15, 1993 Section 7 Agreement (Revised March 8, 2000). The RIPRAP was developed in support of that Agreement.

1.4 ESTIMATED COST OF RECOVERY ACTIONS

The estimated total budget for the Recovery Program from FY 2011–FY 2023 is approximately \$129.1 million. Funding for the Recovery Program is expected to come from the following sources:

- a. An annual operating budget of approximately \$6.5 million, totaling roughly \$92 million from FY 2011–FY 2023 as adjusted annually for inflation. The source of these funds will be: Western Area Power Administration and the U.S. Bureau of Reclamation (hydropower revenues); the U.S. Fish and Wildlife Service; and the States of Colorado, Utah, and Wyoming. Additional annual funding will come from water development depletion fees. Under the Recovery Program, proponents of new water projects which undergo Section 7 Endangered Species Act consultation have agreed to pay a one-time depletion fee based on a project's average annual depletion. The rate is adjusted annually for inflation: as of October 1, 2010 it was \$18.91 per acre foot; the rate increases to \$19.21 per acre foot as of October 1, 2011. The actual rate of water development has not been projected therefore it is difficult to predict the amount of this funding source.
- b. Approximately \$37.1 million will be spent between FY 2011 and FY 2023 for remaining capital projects (\$32.5 million for projects and \$4.6M for

contingencies). P.L. 106-392 authorized capital funding in October 2000; P.L. 107-375 extended construction authority from 2005 to 2008; and P.L. 109-183 authorized Federal appropriations through 2010, increased authorized Federal appropriations from \$46 million to \$61 million, and increased the capital funding total from \$62 million to \$77 million plus adjustments for inflation to the Federal portion. In March 2009, Section 9107 of P.L. 111-11 authorized an additional \$15 million in federal funds and extended the construction period through 2023.

1.5 MEASURING PROGRESS TOWARD RECOVERY AND SCHEDULING RIPRAP ACTIVITIES

To achieve recovery in the Upper Basin, it will be essential to fully implement all of the actions in the RIPRAP; this will be accomplished only through cooperation by all Program participants. In general, actions will be scheduled such that recovery will be achieved in the most expeditious and cost-effective manner possible. However, decisions associated with ongoing Section 7 consultations may require some adjustment in the schedule to ensure recovery of the endangered fishes while water development continues.

Recovery actions likely 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 have been determined by the Service to be most important in determining the extent to which the Recovery Program provides the reasonable and prudent alternatives to jeopardy for projects undergoing Section 7 consultation. These actions are identified by the caret ">" in the Action Plans. Actions that the Service believes will contribute to the RIPRAP serving as a reasonable and prudent alternative to adverse modification of critical habitat are identified by an asterisk (*). These caretted and (or) asterisked actions will generally be given highest priority.

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

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. In addition, significant accomplishments and shortcomings of the past year are highlighted in the RIPRAP tables as part of the Program's annual assessment and update of the RIPRAP.

The first Recovery Action Plan identifies general recovery program support activities important to the success of the Recovery Program. The following Recovery Action Plans are for the Green and Colorado rivers and their subbasins in the Upper Basin. Each action plan is arranged by specific activities to be accomplished within the "recovery elements" listed below:

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

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

2.0 DISCUSSION OF RECOVERY ACTION PLAN ELEMENTS

The Recovery Action Plan tables contain brief descriptions of specific recovery actions planned in each subbasin. In this section, general recovery activities are explained as they apply Upper Basin wide.

2.1 I. IDENTIFY AND PROTECT INSTREAM FLOWS

Recovery cannot be accomplished without securing, protecting, and managing sufficient habitat to support self-sustaining populations of the endangered fishes. Identification and protection of instream flows are key elements in this process. The first step in instream-flow protection is to identify flow regimes needed by the fish. In the Recovery Program, determining flow needs is primarily the responsibility of the 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 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. The contribution of tributaries to recovery was ranked by Tyus and Saunders (2001). A strategic plan was completed in 2003 that identified geomorphology research priorities to refine the flow recommendations and address the Recovery Goals (LaGory et al. 2003).

Flow recommendations have been approved for reaches of the Colorado (Osmundson and Kaeding 1991; McAda 2003), Yampa (Modde and Smith 1995; Modde et al. 1999), Green (Muth et al. 2000), Gunnison (McAda 2003), and Duchesne (Modde and Keleher 2003) rivers. Flows in the Little Snake River after estimated future depletions were identified in the Yampa River Management Plan and Environmental Assessment (Roehm 2004). Interim flow recommendations for the White River were completed in 2004 (Irving et al. 2004) and will be reviewed in 2011. Flow recommendations for the Colorado River below the Green River are pending completion of the Aspinall Unit EIS. Flow recommendations for other rivers or river reaches will be developed as deemed necessary to achieve recovery.

Colorado

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

Where flow protection involves filing for a new water right, it is placed under "Appropriate." With this mechanism, the ownership of the water right is established in the first instance, rather than being conveyed to a subsequent owner. In Colorado, the appropriation of an instream water right follows a structured process developed by the Colorado Water Conservation Board (CWCB) in 1997. The process begins with a Service flow recommendation, which is reviewed by CWCB and the Colorado Division of Wildlife (CDOW). Then CWCB issues a notice of intent to appropriate, followed by their approval to appropriate. Finally, the Attorney General must make a water court filing to confirm the appropriation and to avoid postponement of the appropriation's priority date. It may take 3 to 4 years from the notice of intent to appropriate to obtain a decree from the water court, depending on the nature of any litigation over the filing. In

appropriation, the water right will have a relatively junior priority date (the date CWCB issued the notice of intent to appropriate), and only existing flow conditions can be protected. In most cases, this process has lacked support and thus proven to have limited use in the Recovery Program. Therefore, the Recovery Program adopted a programmatic biological opinion (PBO) approach on the Colorado, Yampa and Gunnison rivers. Recovery Program participants anticipate that this process will prove effective in protecting instream flows for the endangered fishes. The Recovery Program and CWCB reevaluate the need for instream-flow filings every 5 years.

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 Unit, and compensation will be required where storage water is already under contract.)

Utah

Legal protection of flows in Utah will be achieved differently than in Colorado. Several approaches may 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.

Utah examined available flow protection approaches in the 1990's and determined that the strategy they would use most commonly will be to condition the approval of presently filed and new applications, making them subject to predetermined streamflow levels. To accomplish this, the State Engineer adds a condition of approval to water-right applications (within the area) filed after the policy is adopted. The condition states that whenever the flow of the Green River (or other streams) drops below the predetermined streamflow level, then diversions associated with water rights approved after the condition is imposed are prohibited. Based on past legal challenges to the State's authority to impose conditions associated with new approvals, it was determined that this is within the authority of the State Engineer. This approach does not specifically recognize an instream-flow right; however, it does protect the flows from being diverted and used by subsequently approved water rights. This approach was adopted as policy by the State Engineer. The policy requires that presently filed and new applications to be approved are subject to the summer and fall flow recommendations. As flow recommendations are finalized and accepted, Utah will review options for protecting the recommended flows. In 2009, Utah determined that

the aforementioned “subordination” method of flow protection may not be feasible. The Recovery Program’s Water Acquisition Committee formed a task force to develop other options for protecting fish flows on the Green River. This task force has joined with Reclamation to conduct modeling that will incorporate hydrology and future water right claims to use as a planning and policy tool. In 2010, Utah identified the legal and technical process and schedule to protect recommended year-round flows for the endangered fishes in Utah (Utah Department of Natural Resources 2010).

2.2 II. RESTORE AND PROTECT HABITAT

Important elements of habitat protection include restoring and managing in-channel habitat and historically flooded bottomland areas, restoring passage to historically occupied river reaches, preventing fish entrainment at diversion structures (if warranted), 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. Floodplain areas inundated and temporarily connected to the main channel by spring flows appear to be important habitats for all life stages of razorback sucker, and the seasonal timing of razorback sucker reproduction suggests an adaptation for utilizing these habitats. Restoring access to these warm and productive habitats would provide the growth and conditioning environments that appear crucial for recovery of self-sustaining razorback sucker populations. In addition, Colorado pikeminnow also use these areas for feeding prior to migrating to spawning areas. Inundation of floodplain habitats, although most important for razorback sucker, would benefit other native fishes by providing growth and conditioning environments and by restoring ecological processes dependent on periodic river-floodplain connections. Restoration of floodplain habitats could be achieved through a combination of increased peak flows, prolonged peak-flow duration, lower bank or levee heights, and constructed inlets. Studies have shown that full utilization of these floodplain habitats has been hampered by the presence of large numbers of predacious and competing nonnative fish. Studies are underway to determine how this interaction may be reduced to enhance use of these habitats by endangered fish. For example, additional evaluation of the floodplain reset theory will be needed to determine if nonnative fish can be reduced or eliminated during low-flow years.

The Recovery Action Plans contain tasks to identify and restore important flooded bottomland habitats. During 1994, the Recovery Program completed an inventory of floodplain habitats for 870 miles of the Colorado, Green, Gunnison, Yampa, and White rivers. From the list of inventoried habitats, high-priority sites were screened for

restoration potential. Site acquisition began in 1994 and continued through 2003. Since 2003, the Program has completed the razorback sucker floodplain habitat model and floodplain management plans for the Green and Colorado River sub-basins (subject to revision as new information is gathered). Based on the model and these management plans, the Program has shifted from screening additional floodplain sites for potential restoration/acquisition to focusing on sites already acquired or otherwise available for management. Success will be measured by the response of the endangered fish populations.

The General Recovery Program Support Action Plan contains tasks to develop an issue paper on floodplain restoration and protection. This paper identified legal, institutional, and political strategies to enhance and protect floodplain habitats for the endangered fishes and ameliorate the effects of levees, diking, rip-rap, gravel mining, and other forms of floodplain development. Phase 1 of the issue paper identified what floodplain restoration and protection is needed for the endangered fishes; Phase 2 determined how to accomplish that restoration and protection. The issue paper evaluated responsibilities of the Recovery Program, Recovery Program participants, and other agencies involved in floodplain development, regulation, and management, and their roles and responsibilities with respect to endangered species.

Passage barriers have fragmented endangered fish populations and their habitats, resulting in confinement of the fishes to 20 percent of their former range. Blockage of Colorado pikeminnow 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; U.S. Fish and Wildlife Service 1991). Restoring access to historically occupied habitats via fish passage ways was identified in the Colorado Squawfish [Pikeminnow] Recovery Plan (U.S. Fish and Wildlife Service 1991) and in the recovery goals (U.S. Fish and Wildlife Service 2002c) as one of several means to aid in Colorado pikeminnow recovery.

The Recovery Action Plans contain tasks to assess and make recommendations for fish passage at various dams and diversion structures. The need for passage was determined at four sites: Redlands, Grand Valley Irrigation Company (GVIC), Price Stubb, and the Grand Valley Project. Passage has been restored at the Redlands Diversion Dam on the Gunnison River and at the GVIC, Price-Stubb and GVP diversions on the mainstem Colorado River near Palisade, Colorado.

Diversion canals have been found to entrain native and endangered fishes. Construction of fish screens to prevent entrainment of adult and subadult fish is in the planning and design stage at Tusher Wash and construction was completed at the Grand Valley Project and Redlands during 2005. Construction of a screen at the GVIC diversion canal was completed in 2002, but additional improvements to this screen are anticipated. Evaluation of potential entrainment of Colorado pikeminnow in diversion structures on the Yampa River began in 2007 (Hawkins 2009), and will continue in 2011 and 2012.

A number of potentially harmful contaminants (including selenium, petroleum derivatives, heavy metals, ammonia, 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. Specifically, the Service will identify actions needed to reduce selenium contamination to levels that will not impede recovery.

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. No crayfish species are native to the Colorado River Basin (Carpenter 2005). Many of the nonnative aquatic species have been successful due to changes in the river system that favor their survival over that of native fishes. Competition with and predation by nonnative species is widely assumed to have played a role in the decline of the endangered fishes (Tyus and Saunders 1996). However, evidence of direct impacts of introduced species on native fishes is difficult to obtain (Schoenherr 1981) and often is masked by human-caused habitat alterations (Moyle 1976).

In studies on the Green River, researchers documented that young Colorado pikeminnow constituted 5% of the diet of northern pike, even though young Colorado pikeminnow made up a much smaller portion of the available food base in the river (Crowl and Lentsch 1996). Researchers estimated that a single northern pike could consume 100 or more young Colorado pikeminnow per year. Also, northern pike are known to prey on large-bodied native fishes (Martinez 2001, Hawkins et al. 2005, Martin and Wright 2010) including adult Colorado pikeminnow, native roundtail chub (*Gila robusta*), flannelmouth and bluehead suckers, and may also feed on humpback chubs in the Yampa River. Colorado has revised a fisheries management plan for the Yampa River basin (CDOW 2010). Smallmouth bass in the Yampa River have rapidly increased in abundance and pose a significant predatory and competitive threat to native and endangered fishes (Bestgen et al. 2008, Johnson et al. 2008).

Recovery Program activities related to nonnative fishes initially focused on identifying impacts/interactions and developing nonnative fish stocking procedures. Nonnative fish control strategies were developed to identify and prioritize options for controlling or removing nonnative fishes from river reaches occupied by the endangered fishes as well as other reaches that serve as production areas for nonnatives that subsequently disperse into occupied habitat (Tyus and Saunders 1996; Lentsch et al. 1996; Hawkins and Nesler 1991). In February 2004, the Recovery Program adopted a nonnative fish management policy that addresses the process of identifying and implementing nonnative fish management actions needed to recover the endangered fishes (Upper Colorado River Endangered Fish Recovery Program 2004). Through 2009, emphasis has been focused on the control activities identified in these strategies. All nonnative

fish control activities are being evaluated for effectiveness and continued as appropriate. Development of a new basinwide strategy for the management of nonnative aquatic species began in 2009. This strategy will emphasize prevention as a major component in efforts to control existing invasive impacts and to avoid similar impacts arising from existing or new species in additional locations within the Upper Basin.

The States and the Service also have developed final procedures for stocking of nonnative fishes in the Upper Basin (USFWS 1996a, 1996b). The procedures are designed to reduce the impact on native fishes due to stocking of nonnative fishes in the Upper Basin and clarify the role of the States, the Service, and others in the review of stocking proposals. A cooperative agreement has been signed by the States and the Service implementing the Stocking Procedures. The Stocking Procedures were revised in 2009 (USFWS 2009) and the cooperative agreement was updated.

2.4 IV. CONSERVE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS

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

The Recovery Program has recognized the need to increase augmentation and restoration stocking (primarily for razorback sucker and bonytail), both for recovery of the species and to establish fish in the system to be able to demonstrate that habitat and instream flow activities are having an effect on endangered fish recovery. The Recovery Program is implementing an integrated stocking plan developed for bonytail, Colorado pikeminnow (stocking on hold), and razorback sucker. The Recovery Program continues to evaluate the need for implementing an integrated stocking plan for humpback chub especially for restoring specific stocks thought to be too low for adequate natural recruitment. Humpback chub is not currently being stocked; however, augmentation of existing small populations may become necessary and some fish have been brought into captivity.

Studies to confirm genetic diversity have been vital to genetics management of the endangered fishes. Species are being protected in refugia to develop broodstocks and

guard against catastrophe. Representatives of species thought to be in immediate danger of extinction are brought into refugia immediately. Refugia populations of species are developed using paired breeding matrices to maximize genetic variability and maintain genetic integrity.

Most of this work is included under the General Recovery Program Support Action Plan because it applies Upper Basin wide. Subbasin-specific activities of augmenting or restoring species are placed under the subbasin Action Plans. Augmentation or restoration plans are being implemented, fish produced, and river reaches restored and augmented with those fish. The effects of these augmentation efforts need to be monitored and evaluated.

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

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

The Genetics Management Plan is the operational document. It tells the "what, who, when, where" of implementation. It identifies specific objectives, tasks, activities, and type of facilities necessary to accomplish Recovery Program goals, i.e., protect population genetic integrity or restore a self-sustaining population in the wild. 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.

Facilities are required to meet long-term (5 years or more) augmentation and restoration stocking needs. The plans for these facilities are the Coordinated Hatchery Facility Plan and the Facilities Plan. These plans, in accordance with the Genetics Management Plan, define facilities required to meet propagation needs, identify fish needs that can be met by existing facilities, and recommend expansion or modification of existing facilities. Genetics management requires a great deal of operational activity. Refugia and propagation facilities have been planned, built, and are now operated in a coordinated fashion.

The Integrated Stocking Plan (Nesler et al. 2003) provides specific annual numbers of fish and their sizes to be produced at Program hatcheries and stocked into Upper Colorado River Basin river reaches. This plan has been implemented for over 6 years and needs to be revised based on recent estimates of survival of the stocked fish.

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

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

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

Public information and education is crucial to the Recovery Program's success. A strategic, multi-faceted information and education program is being implemented to: develop public involvement strategies at the beginning of any and all projects; educate target audiences (including media, the public and elected officials) about endangered fish and increase their understanding of and support for the recovery of these fish at local, state and national levels; provide opportunities for the public to participate in activities that support recovery; and improve communication and cooperation among members of the Recovery Program.

Numerous site-specific activities are undertaken to promote understanding of, and support for, Recovery Program actions and to involve the public in decisions which may impact specific locations in the Upper Basin. These include public meetings, presentations, communications (e-mails, newsletters, etc.), exhibits and distribution of Recovery Program publications.

The information and education program continues to develop a number of products including an annual newsletter; up-to-date fact sheets; interpretive signs and displays; bookmarks; Congressional briefing documents; and a website. In addition, the Recovery Program actively seeks news media coverage of its activities. Special educational publications are produced as needed.

Because funding for capital construction and ongoing operation and maintenance (O&M) for the Upper Colorado River and San Juan River Basin Recovery Programs is tied together in Federal legislation (Public Laws 106-392, 107-375, 109-183, and 111-11), an annual publication is produced that highlights accomplishments of both programs. The *Program Highlights* publication serves as a briefing document for the non-Federal partners' annual visit to Washington, D.C., and is used for numerous other purposes throughout the year.

In addition to the *Program Highlights* document, the *Swimming Upstream* newsletter and freestanding exhibits (in both small and large formats) now promote both programs. Shared outreach efforts help ensure accurate, consistent information about the endangered fish species and efforts to recover them. They have also proved more cost-effective by sharing publication production costs and exhibit fees.

The Recovery Programs will continue to work with other organizations throughout the Colorado River Basin to ensure that information about the endangered fishes is consistent, current, and accurate.

2.7 VII. PROVIDE PROGRAM PLANNING AND SUPPORT

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

3.0 DISCUSSION OF SUBBASIN RECOVERY PRIORITIES

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

3.1 GREEN RIVER

3.1.1 Importance

The Green River system supports populations of humpback chub and Colorado pikeminnow, and it historically supported populations of bonytail and razorback sucker. The importance of the Green River to the endangered fishes has been established by the Recovery Program and recognized by many biologists. The Colorado Squawfish [Pikeminnow] Recovery Plan (U.S. Fish and Wildlife Service 1991) listed the Green River as the highest priority area for recovery of the species, and the recovery goals (U.S. Fish and Wildlife Service 2002c) consider the Green River subbasin as the center

of the Upper Basin Colorado pikeminnow metapopulation. Habitat in Desolation and Gray canyons supports a self-sustaining humpback chub population, and the last known riverine concentration of wild bonytail was in the Green River within Dinosaur National Monument (U.S. Fish and Wildlife Service 1990a, 1990b, 2002a, 2002b). Recovery plans for humpback chub (U.S. Fish and Wildlife Service 1990a) and bonytail (U.S. Fish and Wildlife Service 1990b) identified the Green River in Desolation and Gray canyons and in Dinosaur National Monument as important to recovery. Until recently, the Green River supported the last known riverine concentration of wild razorback sucker (Lanigan and Tyus 1989; U.S. Fish and Wildlife Service 1998, 2002d).

3.1.2 Recovery Actions

Recovery actions in the Green River have focused on refining the operation of Flaming Gorge dam to enhance habitat conditions for the endangered fishes. A biological opinion was issued on the operation of Flaming Gorge Dam in 1992. This opinion contained seasonal flow recommendations for the Green River at Jensen, Utah, and called for additional research under a specific set of research flows to collect information needed to refine the flow recommendations (particularly flow recommendations for spring and winter) and to develop flow recommendations for other areas of the Green River. The effects of the test flows on the endangered fishes and their habitat were evaluated through a variety of studies through 1997, and a final report including revised flow recommendations was completed (Muth et al. 2000). National Environmental Policy Act (NEPA) compliance on reoperation of Flaming Gorge Dam was completed in 2006 with a Record of Decision executed in February. A new biological opinion was completed in 2005. A study plan for the implementation and evaluation of flow and temperature recommendations for endangered fishes in the Green River downstream of Flaming Gorge Dam was completed in 2007 (Green River Study Plan ad hoc Committee 2007).

Flow recommendations also have been developed for some tributaries to the Green River, such as the Yampa, White (interim flow recommendations), and Duchesne rivers. Tributary and mainstem flow recommendations will be carefully coordinated to address recovery needs from an Upper Basin wide perspective.

An element of the 1992 Flaming Gorge Dam biological opinion identified the need to protect dam releases from possible diversion in the occupied habitat of the endangered fishes. The initial focus of this effort was to legally protect Flaming Gorge releases in the Green River down to the confluence of the Duchesne River for the months of July through October. In 2010, Utah identified the legal and technical process and schedule to protect recommended year-round flows for the endangered fishes in Utah (Utah Department of Natural Resources 2010).

Other Green River activities involve restoration of bottomlands adjacent to the Green River that flood in the spring and provide important habitat for razorback sucker and

Colorado pikeminnow. Levees have been breached to restore 9 sites (574 acres) and perpetual easements have been acquired on six properties (1008 acres).

Projects to identify nonnative fish management strategies for the Green River have been implemented. Active management of northern pike (*Esox lucius*) began in 2001. Active management of smallmouth bass began in 2004.

Refuge (captive) populations of razorback sucker collected from the Green River are being maintained at the Ouray National Fish Hatchery, Ouray, Utah, with backup broodstock being maintained at Wahweap State Fish hatchery, Big Water, Utah. A plan for augmenting razorback sucker in the Green River using hatchery propagated fish was developed and is currently being implemented. Stocking of bonytail at Echo Park was initiated in 2000 in accordance with a stocking plan developed by the State of Colorado. The integrated stocking plan requires stocking of bonytail and razorback sucker in the Green River near Jensen and Green River, Utah.

Population estimates began in 2001 for Colorado pikeminnow in the entire Green River subbasin (Bestgen et al. 2005). These estimates are on a 3-year on, 2-year off cycle. The second 3-year “on” period was completed during 2006–2008 and has shown an increase in the numbers of adult fish in the Green River population (Bestgen et al. 2010). Population estimates for humpback chub in Desolation and Gray canyons were conducted in 2001 and 2002, and expanded in 2003 (Jackson and Hudson 2005). More recent information has shown a decline in this population with recommendations to secure the genetics by bringing fish into captivity (Badame in prep.).

Contamination of water in Stewart Lake and Ashley Creek near Jensen, Utah, with selenium may adversely affect razorback sucker. The Service, U.S. Environmental Protection Agency, and U.S. Bureau of Reclamation (Reclamation) are actively pursuing clean-up activities in these areas independent of the Recovery Program.

3.2 YAMPA RIVER AND LITTLE SNAKE RIVER

3.2.1 Importance

The Yampa River is the largest remaining essentially unregulated river in the Upper Colorado River Basin, and its inflow into the Green River, 65 miles downstream of Flaming Gorge Dam, ameliorates some effects of dam operation on river flow, sediment load, and temperature (Muth et al. 2000). Holden (1980) concluded that flows from the Yampa River, especially spring peak flows, were crucial to the maintenance of the Green River’s “large-river” characteristics and, therefore, very important to maintaining suitable conditions in the Green River downstream of the confluence. The Yampa River supports resident subadult and adult Colorado pikeminnow, contains one of the primary Colorado pikeminnow spawning areas in the Upper Basin and is a major producer of fish for the entire Green River subbasin (Tyus and Karp 1989). A small population of humpback chub exists in the Yampa River in Dinosaur National Monument (Tyus and

Karp 1989; U.S. Fish and Wildlife Service 1990a, 2002a). Spawning aggregations of adult razorback sucker were observed near the mouth of the Yampa River, and adult razorback sucker were 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 bonytail and is associated with some of the most recent captures of this very rare fish. The Bonytail Recovery Plan (U.S. Fish and Wildlife Service 1990b) identified the Yampa River within Dinosaur National Monument as a high priority recovery and/or restoration site.

The Little Snake River provides approximately 28% of the Yampa River's flow and 60% of the Yampa River's sediment supply. The sediment supply of the Little Snake River is believed to be important to the maintenance of backwater nursery areas utilized by young Colorado pikeminnow in the Green River (Smith and Green 1991). Adult Colorado pikeminnow have been captured in the Little Snake River upstream to near Baggs, Wyoming, and humpback chub have been captured in the lower 10 miles of the Little Snake River (U.S. Fish and Wildlife Service 2002a, 2002c).

3.2.2 Recovery Actions

Recovery actions in the Yampa River are focused on control of nonnative fishes and maintaining and legally protecting the flow regime required to recover the endangered fishes. To achieve these objectives, the Recovery Program developed the Yampa River Management Plan which identifies management actions necessary to provide and protect the needs of the endangered fishes while existing depletions for human use continue and water resources are developed to serve foreseeable future human needs in the Yampa River basin (Roehm 2004). The plan proposed to augment Yampa River base flows in accordance with the Yampa River flow recommendations (Modde et al. 1999). Of thirteen alternatives identified and evaluated in the Plan, enlargement of Elkhead Reservoir provided the most reliable water supply at a moderate cost. Construction of the enlargement is complete and water was released for the endangered fish beginning in 2007. The Program funded a 5,000 af pool of permanent storage out of the 12,000 af Elkhead enlargement and may lease up to an additional 2,000 af on an as-needed basis.

Colorado filed for a junior instream-flow water right for the Yampa River between the confluences of the Williams Fork and Little Snake rivers in December 1995. Forty-eight statements of opposition were filed against these filings in State water court.

As a result of concerns expressed by the Service and other Program participants, CWCB withdrew the baseflow and recovery flow instream-flow filings on the Yampa and Colorado rivers. With the approval of the PBO for the upper Colorado River upstream of the Gunnison River confluence, CDOW staff was instructed by CWCB to develop new methodologies and flow recommendations.

A cooperative agreement implementing the Yampa River Management Plan and a PBO were completed for the Yampa River in 2005. The Recovery Program and CWCB will reevaluate the need for instream-flow filings every 5 years.

Flow contributions from the Little Snake River, as they assist in recovery in the Yampa River, were identified after estimated future depletions were accounted for in the Yampa River Management Plan and Environmental Assessment (Roehm 2004).

The Recovery Program has evaluated several low-head agricultural-water diversion dams on the Yampa River for Colorado pikeminnow passage. A variety of existing diversions between Craig, Colorado, and Dinosaur National Monument were inventoried in 1994–1995. Several diversions were identified as possible barriers to fish migration under certain conditions (Hydrosphere 1995a). However, due to uncertainties about whether these diversions were in fact barriers to Colorado pikeminnow movement during the migration period, a study was conducted to determine threshold flows for adult Colorado pikeminnow passage on the Yampa River between Craig and Dinosaur National Monument. It was determined that these barriers present little if any problem to fish movement during the periods when Colorado pikeminnow migrate to and from spawning habitats downstream. Evaluation of entrainment of Colorado pikeminnow in the larger Maybell diversion began in 2007 and will continue in 2011 and 2012.

The Recovery Program began removing nonnative sportfish from certain reaches of the Yampa River and, where feasible, relocating them to more acceptable waters in 1999. Active management of channel catfish in Yampa Canyon began in 2001. This work was discontinued in 2007 (except for incidental removal of very large fish) to focus on the control of smallmouth bass, whose population expanded dramatically in the early 2000s coincident with the abrupt decline in small-bodied and juvenile native fishes and a rapid increase in virile crayfish (*Orconectes virilis*) (Martinez, in prep.). In 2004, the Program began tagging northern pike in the Yampa River upstream of the Hayden Bridge to determine if it is a significant source of northern pike moving downstream into critical habitat. Active management of northern pike downstream of Hayden began in 2003. In 2005, CDOW began undertaking work to determine sources of northern pike that may gain access to endangered fish critical habitat in the Yampa River. Prior to the 2011 sampling season, the Recovery Program recommended and CDOW agreed to discontinue the pike marking pass in the Yampa River buffer zone.

Active control of smallmouth bass in a 12-mile treatment reach in Little Yampa Canyon, a 5-mile treatment reach in Lily Park, and in the lower Yampa River in Yampa Canyon began in 2004. The 12-mile treatment was expanded to 24 miles in 2006 in order to geographically include the targeted population. Management was also expanded in 2006 to include the South Beach reach immediately upstream of the Little Yampa Canyon treatment reach in order to focus control on concentration areas. In 2009, smallmouth bass management was expanded throughout critical habitat. Prior to the 2011 sampling season, the Recovery Program recommended and CDOW agreed to cease translocation of adult smallmouth bass from the Yampa River into Elkhead

Reservoir due to concerns about the rate of escapement of translocated and resident smallmouth bass from the reservoir and the propagule pressure and proliferative capacity of these escapees within critical habitat.

The Program's integrated stocking plan (Nesler et al. 2003) outlines plans for stocking bonytail in the middle Green River which includes the confluence of the Yampa River. Stocking bonytail at the confluence of the Yampa and Green rivers was initiated in 2000.

3.3 DUCHESNE RIVER

3.3.1 Importance

Colorado pikeminnow and razorback sucker 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 pikeminnow and razorback sucker. More recently, fish surveys have been conducted in the lower 33 miles of the Duchesne River and have documented seasonal use by Colorado pikeminnow and razorback sucker.

3.3.2 Recovery Actions

Initial flow recommendations were developed for the Duchesne River in 1995 to address immediate concerns of several proposed water projects being considered in the Duchesne River basin. A follow-up study to evaluate and refine these flow recommendations began in 1997 and was completed in 2003 (Modde and Keleher 2003). A water availability study was completed that identified sources of water to meet the flow recommendations. A coordinated reservoir operations study was completed in 2004. The Duchesne Biological Opinion issued in 1998 was updated in 2005. Agreements will be developed to provide flows in the Duchesne River for the endangered fishes. The Recovery Program participated in rehabilitation of the Myton Townsite Diversion Dam on the Duchesne River (completed in 2009) to help implement the flow recommendations for the endangered fish.

Management of nonnative fishes in the Duchesne was discontinued in 2007 and efforts reallocated to smallmouth bass concentration areas in the Green River. Nonnative fish management resumed in the Duchesne River in 2008 from the Myton Diversion downstream to the confluence with the Green River. A study to determine escapement of nonnative fishes from Starvation Reservoir was begun in 2002; a final report was approved in January 2007. Results suggest that escapement is occurring, but not enough to warrant the installation of screens.

3.4 WHITE RIVER

3.4.1 Importance

Adult Colorado pikeminnow occupy the White River downstream of Taylor Draw Dam near Rangely, Colorado, in relatively high numbers. Adult Colorado pikeminnow resident to the White River spawn in the Green and Yampa rivers. Juvenile and subadult Colorado pikeminnow also utilize the White River on a year-round basis. Incidental captures of razorback sucker have been recorded in the lower White River. Construction of Taylor Draw Dam in 1984 blocked Colorado pikeminnow migration to upper portions of the White River. The White River within Utah appears to be a stronghold for native fishes and management efforts in this basin should strive to preserve this feature of the river (Breen and Hedrick 2009, 2010).

3.4.2 Recovery Actions

A work plan for the White River was developed to synthesize current information about the endangered fish and provide recommendations for specific recovery actions, including the merits of providing fish passage at Taylor Draw Dam. Interim flow recommendations for the White River were completed in 2004 (Irving et al. 2004) and a review began in 2009. The availability of data needed to update the flow recommendations will be assessed and a determination made regarding the need for and timing of refinement of the recommendations. Instream-flow filings are on hold pending reevaluation of how flows will be legally protected in Colorado.

3.5 COLORADO RIVER

3.5.1 Importance

The mainstem Colorado River from Rifle, Colorado, to Lake Powell, Utah, supports populations of humpback chub and Colorado pikeminnow, and is recognized as important to the recovery of all four endangered fishes (U.S. Fish and Wildlife Service 1990a, 1990b, 1991, 1998, 2002a, 2002b, 2002c, 2002d). Relatively large populations of humpback chub occur at Black Rocks and Westwater canyons near the Utah-Colorado state line. However, both populations appear to have experienced a decline around the year 2000 and have remained low since that time (Elverud in prep. and Francis and McAda in prep). Population estimates begin again in 2011 and the Program will consider preliminary results and recommendations from reports currently in preparation in deciding what steps need to be taken. A smaller humpback chub population occurs in Cataract Canyon, and some of the last wild bonytail were collected in this river reach. All life stages of Colorado pikeminnow occur in the section of river from Palisade, Colorado, downstream to Lake Powell. Numbers of adult Colorado pikeminnow have continued to increase since 1992 (Osmundson and White 2009). Colorado pikeminnow have been translocated and stocked into the upper reach of the

Colorado River between Palisade and Rifle, Colorado; natural access to this historic-habitat reach until recently had been blocked since the early 1900's by three diversion dams near Palisade. Wild razorback sucker populations in the mainstem Colorado River have declined precipitously in the past 20 years. Recapture of stocked razorback sucker have increased in recent years.

3.5.2 Recovery Actions

A variety of recovery actions are planned, ongoing, or completed for the Colorado River. Numerous approaches are being taken to restore flows in the 15-mile reach immediately upstream from the confluence of the Gunnison River to levels recommended by the Service. Reclamation has made available 5,000 acre-feet of water annually plus an additional 5,000 acre-feet in four of every five years from Ruedi Reservoir to augment flows in the 15-mile reach during July, August, and September. In addition, water is available from the lease of 10,825 acre-feet/year of water from Ruedi Reservoir and permanent commitment of 10,825 acre-feet/year from East and West slope water users. East and West slope 10-year commitments were secured in 2000 by Memoranda of Agreement (MOA) with the Colorado River Water Conservation District (CRWCD) and Denver Water for delivery of 5,412 acre-feet of water from Wolford Mountain Reservoir and 5,412 acre-feet from Williams Fork Reservoir, respectively (extended through 2013). To replace these interim sources of water and meet their obligations to provide 10,825 af of water to the 15-Mile Reach on a permanent basis, East and West slope water users cooperatively analyzed a wide range of alternatives, reaching consensus on the "Lake Granby-Ruedi" option which they are now working to implement. Signing of agreements to provide the permanent sources of water is expected in mid-2011, with implementation of the permanent sources by 2013.

In 1992, Colorado filed an application in State water court for a 581 cubic feet per second (cfs) instream-flow right in the 15-mile reach for the months of July, August, and September. A final decree was issued in 1997. Colorado filed for a junior instream-flow right for the 15-Mile Reach in December 1995, which was opposed in State water court.

As a result of concerns expressed by the Service and other Recovery Program participants, CWCB withdrew the baseflow and recovery flow instream-flow filings on the Colorado and Yampa rivers. With the approval of the PBO for the upper Colorado River upstream of the Gunnison River confluence, CDOW staff was instructed by CWCB to develop new methodologies and flow recommendations. The Recovery Program and CWCB will reevaluate the need for instream-flow filings every 5 years as called for in the PBO.

Flow recommendations and protection for the Colorado River downstream from the confluence of the Gunnison River will be addressed following completion of necessary

environmental compliance. The Service completed their Gunnison River Programmatic Biological Opinion in December, 2009. Reclamation may complete their EIS in 2011.

Water is being provided to the 15-Mile Reach through an MOA with CRWCD for delivery of up to 6,000 acre-feet of water from Wolford Mountain Reservoir. Other sources of water for the 15-mile reach include construction of the Grand Valley Water Management Project and operation of Federal and private projects. A study of options for providing additional water primarily to augment spring peak flows was completed in 2003. Water users are exploring ways to increase participation in the expanded coordinated reservoir operations (CROS) as recommended in the study report and completed a CROS implementation plan in February 2006. CROS began in 1997 and was conducted in 1997, 1998, 1999, 2006, 2008, 2009, and 2010 as flows permitted.

Reclamation has constructed fish passage at the GVIC and GVP diversion dams on the upper Colorado River. Construction of passage at the Price-Stubbs diversion dam was completed in 2008. Fish passage at these diversion dams benefits both Colorado pikeminnow and razorback sucker (as well as other non-listed, native species) by providing access to approximately 50 miles of the river that was used historically by these fishes. To prevent entrainment of endangered fishes into diversion canals, fish screens have been constructed at GVIC and at the Grand Valley Project.

To restore floodplain habitats, levees have been breached at 3 sites (46 acres) and ten properties acquired in perpetual easement or fee title to protect 394 acres.

Active management of smallmouth bass began in 2004. Largemouth bass also are targeted, but fish >10" in length originally were to be translocated to Highline Lake. Prior to the 2011 sampling season, the Recovery Program recommended and CDOW agreed to cease translocation of largemouth bass. Operation of the fish barrier net at Highline Reservoir has been ongoing since 1999; the net was replaced in March 2006 and is scheduled for replacement in 2012. A CSU/CDOW study to determine the source of centrarchid fishes suggested that floodplain pond contributions to riverine nonnative fish populations fluctuate with the interannual variations in flow regime and river-pond connectivity (Whitledge et al. 2007).

Razorback sucker and bonytail are being stocked in the Colorado River in accordance with the integrated stocking plan (Nesler et al. 2003).

3.6 GUNNISON RIVER

3.6.1 Importance

The Gunnison River is currently occupied by wild Colorado pikeminnow and is historic habitat for razorback sucker and presumably bonytail. Several adult Colorado pikeminnow were captured in the Gunnison River in fishery surveys conducted in 1992 and 1993. Unrestricted migration of fish has been limited by the 10-foot high Redlands

diversion dam located 2 miles upstream from the mouth of the Gunnison River. Several Colorado pikeminnow larvae have been collected in the Gunnison River upstream and downstream of the Redlands diversion dam. Kidd (1977) reported that adult razorback sucker were collected frequently by commercial fishermen near Delta, Colorado, between 1930 and 1950. Razorback sucker larvae were recently collected in the Gunnison River (Osmundson and Seal 2009), and the reach near Delta is considered a priority razorback sucker restoration site. The native fish assemblage in the Gunnison River is presently less impacted, compared to other rivers, by nonnative fishes (particularly piscivorous species), and management efforts should emphasize preserving this feature of the river.

3.6.2 Recovery Actions

Recovery activities on the Gunnison River are focused on operating and evaluating a fish ladder at the Redlands diversion dam, reoperating the Aspinall Unit to improve flow/habitat conditions in the Gunnison River, and restoring flooded bottomland habitats near Delta. Perpetual easements have been acquired on three properties (198 acres). Construction of a fish ladder at the Redlands diversion dam was completed in 1996 and has provided for passage of Colorado pikeminnow, razorback sucker, and other native fishes (as well as allowing exclusion of nonnative fishes). In 2010, the first humpback chub (previously captured in Westwater Canyon, Utah) used the ladder, which means all four species of endangered fish have been collected. To prevent entrainment of adult and subadult endangered fish into diversion canals, a fish screen was installed at Redlands in 2005.

A 5-year research plan to evaluate the effects of the Aspinall Unit on the endangered fishes and their habitat was completed in 1997. During this research period, Reclamation and Western Area Power Administration provided test flows. The research culminated with the Service's final flow recommendations in 2003 (McAda 2003). Reclamation has begun the NEPA process and released a draft EIS in February 2009. Their Preliminary Final EIS was sent to the cooperators in November 2010. The Service issued a programmatic biological opinion in December 2009. Legal protection of Aspinall releases and State protection of instream flows in the Gunnison River will be addressed now that the biological opinion on the Aspinall Unit is complete.

Beginning in 1995, the Service experimentally stocked razorback sucker in the Gunnison River near Delta. The State of Colorado stocking plan for razorback sucker was revised in 2003 to stock fewer but larger fish. Stocking of razorback sucker continues in the Gunnison River, in accordance with the integrated stocking plan.

3.7 DOLORES RIVER

3.7.1 Importance

The Dolores River is historic habitat for Colorado pikeminnow; both adult and young-of-the-year fish were captured in the 1950's and 1960's. Valdez et al. (1991) documented the use of the lower 1 mile of river by Colorado pikeminnow. 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 Colorado pikeminnow in the Dolores River drainage. Since 1996, bonytail have been stocked in the Colorado River near the confluence of the Dolores.

3.7.2 Recovery Actions

Recovery actions for the Dolores River drainage have been limited to preventing escapement of nonnative sport fish (e.g., smallmouth bass, yellow perch, and kokanee salmon) from McPhee Reservoir. Environmental contaminant clean-up is being pursued by State and Federal agencies independent of the Recovery Program. It is unknown if stocked bonytail are using the Dolores River. Utah conducted surveys on the Dolores in 2005 and detected bluehead suckers, roundtail chub, and one flannelmouth sucker (no bonytail were captured). The Program will consider the need for additional recovery actions in the Dolores River as new information becomes available.

4.0 RECOVERY ACTION PLANS

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

The Recovery Action Plans are formatted in stepdown-outline tables. This is reflected in the numbering system and indenting. Some actions which assess options or the feasibility of a recovery action are followed by a subsequent implementation step, and

others are not, depending on how feasible the implementation step is considered to be at this time.

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

BR	U.S. Bureau of Reclamation
CO	State of Colorado
CDA	Colorado Department of Agriculture
CDOPR	Colorado Division of Parks and Outdoor Recreation
CDOW	Colorado Division of Wildlife
CRWCD	Colorado River Water Conservation District
CWCB	Colorado Water Conservation Board
FWS	U.S. Fish and Wildlife Service
	-ES Ecological Services
	-FR Fishery Resources
	-RW Refuges and Wildlife
	-WR Water Resources
LFL	Larval Fish Laboratory
NWCD	Northern Water Conservancy District
PD	Recovery Program Director
TBD	To be determined
UT	State of Utah
UDWR	Utah Division of Wildlife Resources
UTWR	Utah Division of Water Resources
WAC	Water Acquisition Committee
WYGF	Wyoming Game and Fish Department

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)									
I.A.	Evaluate methods for defining habitat-flow needs and select methods most appropriate to specific stream reaches.									
I.A.1.	Review instream flow methodologies and assess the technical adequacy of current flow recommendations.	PD	Complete							"Guru II." Center for Public-Private Sector Cooperation, 1993.
I.A.2.	Develop recommendations for integrating geomorphology and food web studies into Recovery Program.	PD	Complete							Andrews, et al, 1996.
I.A.3.	Evaluate CDOW's instream flow methodologies and flow recommendations for warmwater native fishes (Anderson) as they relate to flows needed for endangered fish recovery.	FWS/PD	Complete							The Biology Committee reviewed Rick Anderson's report in April 2005, raised numerous questions regarding the application of this methodology to endangered fish flow recommendations, and declined to act on the report. The Service does not support adopting Anderson's methodology as the standard methodology for making flow determinations.
I.A.4.	Develop strategic plan for geomorphic research and monitoring.	Program	Complete							LaGory et al., 2003.
I.A.4.a.	Develop strategy and design for studies to address geomorphic research priorities.	Geo. Work Group	Ongoing							
I.A.4.b.	Conduct needed geomorphic research and monitoring.	Program	Ongoing	X	X	X	X	X	X	
I.B.	Develop and select methods for modifiable protection of instream flows in Colorado.									
I.B.1.	Develop, evaluate and select, as appropriate, options for interim protection of instream flows until uncertainty concerning habitat needs and water availability can be resolved.									
I.B.1.a.	Colorado Attorney General review.	CO	Complete							CWCB adopted the Statement of Policy and Procedure Regarding the Appropriation of Instream Flows for the Recovery of Endangered Fishes of the Upper Colorado River Basin on March 9, 1994 and S.B. 96- 064 concerning instream flow appropriations of the CWCB was passed in May 1996.
I.B.1.b.	CWCB approval/recommended action.	CWCB	Complete							
I.B.1.c.	Adopt legislation or regulation, if necessary.	CWCB	Complete							
I.B.2.	Evaluate options for allocating Colorado's compact entitlement among the five subbasins, the implications for water available to recover the endangered fishes, and implications of full protection of recovery flow recommendations on development of Colorado's compact entitlement.	CWCB	Complete							CWCB completed work on water availability study in 1995 after convening subbasin work groups. Scenarios for future development and estimates for future water use were outlined for each basin.
I.B.3.	Assess need for retirement of senior conditional water rights.	CWCB/FWS	Dropped							Colorado law prohibits conversion of conditional water rights to instream flow
I.C.	Develop an enforcement agreement between the Service and appropriate State agencies to protect instream flows acquired under the Recovery Program for the endangered fishes.									
>*	I.C.1. Colorado.	FWS/CWCB	Complete							Agreement with FWS concerning the enforcement and protection of fish recovery flow water rights adopted by CWCB on September 21,1993.
I.D.	Develop tributary management plans (based in part on the tributary report, see V.F., pg. 23).									
I.D.1.	Assess need for tributary management plans on a site specific basis.	PD	Complete							2004: PD's office determined most tributaries covered by biological opinions (except White and San Rafael rivers), so this item was moved to Green River Action Plan.
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)									
II.A.	Restore flooded bottomland habitats.									
II.A.1.	Conduct inventory of flooded bottomland habitat for potential restoration.	FWS-FR	Complete							Inventory completed (see Irving & Burdick, 1995 as primary reference)
II.A.2.	Screen high-priority sites for potential restoration/acquisition.	PD	Complete							Future acquisition of sites to be determined.
II.B.	Support actions to reduce or eliminate contaminant impacts. [NOTE: Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program]									Report on 2010 contaminants-related activities in the upper basin being finalized (also will address II.B.3).
II.B.1.	Evaluate effects of selenium.	FWS-ES	Ongoing	X	X	X	X	X	X	

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
	II.B.1.a. Identify actions to reduce selenium contamination to levels that will not impede recovery.	FWS-ES	Ongoing	X	X	X	X	X	X		
	II.B.2. Identify locations of petroleum-product pipelines and assess need for emergency shut-off valves.										
>*	II.B.2.a. Ensure that all new petroleum product pipelines have emergency shutoff valves.	FWS-ES	Ongoing	X	X	X	X	X	X		
>*	II.B.2.b. Identify locations of existing petroleum-product pipelines potentially affecting critical habitat and determine if they have emergency shutoff valves.	FWS-ES, States	Pending	X	X					The Pipeline and Hazardous Materials Safety Administration has developed the Pipeline Integrity Management Mapping Application (PIMMA) for use by pipeline operators and Federal, state, and local government officials. This should be a valuable tool in assessing threats to endangered fish. FWS-ES should investigate use of PIMMA to address existing pipelines which may need shutoff valves. (Shutoff valves have been required on new pipelines since 2003.)	
	II.B.3. Review and recommend modifications to State and Federal hazardous materials spills emergency response programs.	FWS-ES	Ongoing	X	X	X	X	X	X		
	II.C. Develop an issue paper on the desirability and practicality of restoring and protecting certain portions of the floodplain for endangered fishes and evaluate the floodplain restoration program.										
	II.C.1. Identify what restoration and protection are needed by addressing: 1) biological merits of restoring the floodplain with emphasis on endangered fish recovery; 2) priority geographic areas; and 3) integration of a broader floodplain restoration initiative into the current Recovery Program floodplain restoration program.	PROGRAM	Complete	Phase 1 floodplain protection issue paper approved by Mgmt. Comm. 1/98 (Nelson 1998). Phase II (Tetra Tech 2000) and synthesis reports left in draft and highest priority work moved into Green and Colorado River floodplain management plans (Valdez and Nelson 2004a,b). Final draft floodplain issues report given to Mgmt. Comm. 2/00. Phase II							
	II.C.2. Identify how to conduct restoration and protection by addressing: 1) restoration and protection tools/approaches; 2) institutional options for floodplain restoration; 3) costs/funding strategy; and 4) implementation steps and schedule.	PD/CO/UT	Complete	(Tetra Tech 2000) and synthesis reports left in draft and highest priority work moved into Green and Colorado River floodplain management plans (Valdez and Nelson 2004a,b). Final draft floodplain issues report given to Mgmt. Comm. 2/00. Phase II							
	II.C.3. Identify viable options and develop specific restoration strategies for selected geographic areas (e.g., Grand Valley, Green River).	PD	Complete	Final draft floodplain issues report given to Mgmt. Comm. 2/00. Phase II and synthesis reports left in draft and highest priority work moved into Green and Colorado River floodplain management plans (Valdez and Nelson 2004							
	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.									Nonnative fish strategy will be completed in 2011. Draft expected September 1, 2011, will recommend focusing on prevention, eradication and swift control of problematic species.	
	III.A.1. Where not already generally known, identify negative impacts (e.g., predation, competition, hybridization) of problem species.										
	III.A.1.a. Determine role of nonnative fishes as potential competitors with bonytails and determine size-specific vulnerability of bonytails to nonnative fish predators.	UDWR	Complete	Adler and Crowl 1995, Bissonette and Crowl 1995, Lentsch et al. 1996a.							
	III.A.1.b. Assess impact of northern pike predation on Colorado pikeminnow in the Green River.	UDWR	Complete	Crowl and Lentsch 1996.							
	III.A.1.c. Re-evaluate levels of hybridization with white sucker and assess effects on razorback sucker populations. (Program will monitor for evidence of hybridization as razorbacks increase in the system.)	FWS/UDWR/ CSU	Ongoing	X	X	X	X	X	X	Additional efforts begun in 2010 position the Program to further evaluate the extent of white sucker hybridization throughout the upper and middle Green and Yampa river systems. CRFP-Grand Junction working with geneticists to determine incidence of sucker hybridization in larval samples collected from Colorado and Gunnison rivers. Program needs to establish process to track percentages of hybrid suckers using standardized protocol for identification of hybridization at fish ladders and in monitoring reaches.	
>*	III.A.1.c.(1) If necessary, implement actions to minimize hybridization between white sucker and razorback sucker.	FWS/UDWR/ CSU	Pending							See above.	
	III.A.1.d. Develop protocol for actions to be taken when a new nonnative species invasion or expansion is detected. (YS E-1)	PD	Pending							See III.B.6 below.	
	III.A.2. Identify and implement viable active control measures.										
	III.A.2.a. Identify 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.	PD	Complete	Hawkins and Nesler 1991; Lentsch et al. 1996b; Tyus and Saunders 1996. Upper Colorado River Endangered Fish Recovery Program 2004.							
	III.A.2.b. Review options and develop agreement with appropriate States on strategies and locations for implementing control options. Develop Nonnative Fish Management Policy.	FWS/STATES	Complete								

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		ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
>*	III.A.2.c.	Evaluate the effectiveness (e.g., nonnative and native fish response) and develop and implement an integrated, viable active control program.	PD/FWS/ STATES	Ongoing	X	X	X	X	X	X	! At the December 2010 Nonnative Fish Workshop, PI's, managers, and other interested parties discussed preliminary results from the 2010 field studies; suggested revisions to the 2011 Work Plan; and developed content for three collaborative presentations. Similar to 2010, the collaborative presentations were made at the 2011 Upper Basin Researcher's Meeting and PI's and the Program came away from the workshop with enough clear guidance to immediately start revising 2011 SOW's. Revisions respond to the need to expand efforts to increase removal / disruption further into the SMB spawning period (e.g., sampling schedules being extended to exploit smallmouth bass in post-peak flows on the Yampa). Based on the 2010 Nonnative Fish Workshop discussions, the Recovery Program recommended and CDOW agreed to cease translocation of smallmouth bass and discontinuing the mark and release pass within the Yampa buffer zone (Hayden to Craig).
	III.A.2.c.(1)	Project-level synthesis: synthesize data on each species/river nonnative fish control effort and concomitant native fish response (e.g., smallmouth bass in the Yampa River and native fish response in the Yampa River) (completed by PI's and identified as a task in individual scopes of work). (YS G-3)	PI's	Ongoing	X	X				X	The final first round synthesis report (project 98a) has now been completed. The Nonnative Fish Subcommittee has recommended that the next drafts be completed in March 2012 for 1) northern pike; 2) Yampa River native fish response; 3) Green River native fish response and 4) Lodore/Whirlpool Canyon; however additional funding needed to complete these synthesis reports may not be available.
	III.A.2.c.(2)	Programmatic synthesis: assimilate project-level syntheses into a basinwide and population scale analyses of effectiveness of nonnative fish management. (YS G-3)	PD	Ongoing	X	X					CSU's evaluation of the Program's smallmouth bass control is well underway and the post-doc provided preliminary presentations at the Nonnative Fish Workshop and Upper Basin Researcher meeting. Preliminary results indicate: 1) that this analysis will be helpful in re-directing or intensifying removal efforts; and 2) populations may be affected more by environmental factors (flows and temperature) than by removal efforts as of 2008. The Program is extending the contract to allow inclusion of 2009 and 2010 data. Biology Committee endorses concept of a similar northern pike synthesis.
	III.A.2.c.(3)	Develop one or more standardized nonnative fish datasets to facilitate data analyses and information tracking (one dataset will incorporate all tagging data, others may incorporate all movement, mark-recapture, removal data, etc.) *YS G-1.) Relates to item V.A.1., Interagency Data Management.	Program	Ongoing	X	X	X	X	X	X	Ongoing. NNF PI's submit their standardized data sets to CRFP-GJct no later than March 15 each year.
	III.A.2.c.(4)	Evaluate additional techniques to improve data analysis (e.g., advanced software, exploitation models, ecosystem response models). (YS M-1,2)	Program	Ongoing	X	X	X	X	X	X	The programmatic smallmouth bass synthesis, III.A.2.c.(2) will provide guidance.
>*	III.A.2.d.	Close river reaches to angling where and when angling mortality is determined to be significant. (See specific river reaches.)	STATES	Ongoing, as needed	X	X	X	X	X	X	
	III.A.2.e.	Increase law enforcement activity to decrease angling mortality.	STATES	Ongoing	X	X	X	X	X	X	
>*	III.A.2.f.	Develop control program for removal of small nonnative cyprinids in backwaters and other low velocity habitats. (Trammell et al. 2002 and 2005 complete, but development and implementation of a control program is on hold.)	STATES	On hold							See Green River.

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
>*	III.A.2.g. Evaluate other methods for controlling nonnative fishes, including manipulation of flow and temperature, use of fish attractants, pathogens, genetic modification, and chemical piscicides. (YS N-1,2,3,4)	Program	Ongoing	X	X	X	X	X	X	! Researchers at LFL continue to investigate relationships between smallmouth bass spawning/recruitment and environmental conditions to serve as the basis for a future flow manipulation study (likely targeting the Green River below Flaming Gorge Dam). The Program helped sponsor and participated in a National Biocontrol Symposium in Minnesota in June 2010; nonnative fish coordinator relayed information and lessons learned to the Biology Committee and Upper Basin Researchers Meeting and is incorporating these in the draft Nonnative Fish Strategy. The Program continues to fund CSU study analyzing otolith/crayfish microchemistry to determine sources of nonnative fish found in the rivers (see also III C. below).
	III.B. Reduce negative impacts to endangered fishes from sportfish management activities.									Program began coordinating with State partners on use and need for hazard analysis and critical control point (HACCP) protocol/training in fishery management for states, other agencies and privates sector to better ensure that inadvertent introductions of problematic species do not occur.
	III.B.1. Implementation Committee approval of Interim Nonnative Fish Stocking Procedures.	PD	Complete	IC gave proxy in January 1994; States & Service approved in spring of 1994.						
	III.B.2. Implement Interim Nonnative Fish Stocking Procedures.									
	III.B.2.a. Develop scope of work for evaluation of Interim Procedures.	PD	Complete	FY 95 SOW #62 (FWS, CO, UT, WY)						
	III.B.2.b. Evaluate and revise Interim Procedures.	PD	Complete	Procedures for Stocking Nonnative Fish Species in the Upper Colorado River Basin, USFWS 1996.						
	III.B.3. Finalize revised Nonnative Fish Stocking Procedures.									Revised Procedures (2009) recommended use of triploid/hybrid warmwater fishes for which literature/experience/example supports functional sterility and utilization in other states/agencies in all proposals for stocking warmwater fish species in the UCRB.
	III.B.3.a. Complete Biological Opinion/NEPA compliance.	FWS-ES/FR	Complete	FONSI, USFWS 1996.						
	III.B.3.b. Implementation Committee approval of revised Nonnative Fish Stocking Procedures.	PD	Complete	Implementation Committee approval October 2, 1996.						
	III.B.3.c. State wildlife commissions approval, as necessary.	STATES	Complete							
	III.B.3.d. Execute memoranda of agreement between Service and States.	FWS/STATES	Complete	Cooperative agreement for implementation of procedures for stocking of nonnative fish species in the Upper Colorado River Basin. Agreement in 1996 Stocking Procedures.						
	III.B.4. Incorporate final Procedures into State aquaculture permitting process.									
>*	III.B.4.a. Colorado.	CDA/CDOW	Complete	January 1999.						
	III.B.4.a.(1) Evaluate effectiveness of Colorado's stocking regulation.	CDOW	Complete	Martinez & Nibelink 2004.						
>*	III.B.4.b. Utah.	UDWR	Complete							
>*	III.B.4.c. Wyoming.	WYGF	Complete							
	III.B.5. Explore options for tribal acceptance of Nonnative Fish Stocking Procedures.	FWS-FR	Complete	Tribe verbally accepted Procedures (per memo from Dave Irving to Bob Muth, 2003).						
	III.B.6. Review, evaluate, and revise as needed, the Nonnative Fish Stocking Procedures.	PD/FWS/STATES	As needed							CDOW pursuing 2011 regulation revisions to implement 2009 Stocking Procedures. Utah working toward shifting all stocking to triploid salmonids. Signatories should adhere to Procedures's recommendation regarding use of triploid/hybrid warmwater fishes for which literature/experience/example supports functional sterility and utilization in other states/agencies in all proposals for stocking warmwater fish species in the UCRB.
	III.B.7. Increase law enforcement activity to prevent illicit stocking.									
	III.B.7.a. Develop plan	STATES	Pending	X	X					Recommend Utah and Colorado emulate Wyoming and adopt strict and severe penalties for illegal introduction of nonnative aquatic species and facilitate education, enforcement and incentives to promote compliance and prosecution as needed.

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
>*	III.B.7.b. Implement plan	STATES	Pending	X	X	X	X	X	X	! Wyoming implemented stricter penalties for "stocking fish without consent" beginning in 2010. ! Colorado implemented a policy prohibiting live transport of crayfish on the west slope. (Utah already has policy preventing live transport of fish and crayfish.)	
	III.B.8. Evaluate designation of native fish conservation areas	STATES	Pending	X	X	X	X	X	X	UT and WY are promoting this idea. Pending articles in <i>Fisheries</i> magazine will further describe the concept.	
	III.C. Evaluate sources of nonnative fishes into critical habitat using isotope technology.	CDOW	Ongoing	X	X	X	X	X	X	! CSU investigations have resulted in otolith markers for water chemistry for reservoirs throughout the basin. Fish that were stocked, spawned or spent time in reservoirs reflect corresponding otolith microchemistry which the Program will use to track origins of fish collected in critical habitat. Technique has forensic potential for prosecuting cases of illegal fish transport or possession of live fishes in illegal stocking cases. In 2011, CSU will verify river signatures using non-migratory sentinel organism (crayfish).	
IV.	MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES)										
IV.A.	Genetics Management.										
IV.A.1.	Develop and approve Genetics Management Guidelines.	PD	Complete	Williamson and Wydoski 1994.							
IV.A.2.	Develop and implement Genetics Management Plan for all species and update as needed.	PD	Ongoing (updated 6/99)	X	X	3/31/2013	X	X	X	Program needs to update <i>Gila</i> genetic management plan.	
IV.A.3.	Conduct genetic diversity studies (includes <i>Gila</i> taxonomy studies) and confirm presumptive genetic stocks based on all available information.										
IV.A.3.a.	Razorback sucker.	BR	Complete	Wydoski 1995, Czapla 1999.							
IV.A.3.b.	Bonytail and humpback chub.										
IV.A.3.b.(1)	Morphological and allozyme analyses. (Draft 4/95)	PD	Complete	Douglas and Douglas 2007. Keeler-Foster 2008.							
IV.A.3.b.(2)	Mitochondrial DNA analysis.	BR	Complete	Douglas and Douglas 2007. Keeler-Foster 2008.							
IV.A.3.c.	Colorado pikeminnow.	PD	Complete	Williamson et al. 1999.							
>	IV.A.4. Secure and manage the following species in hatcheries (according to the Genetics Management Plan).										
IV.A.4.a.	Razorback sucker.										
IV.A.4.a.(1)	Middle Green	FWS-FR	Ongoing	X	X	X	X	X	X		
IV.A.4.a.(2)	Upper Colorado River.	FWS-FR	Ongoing	X	X	X	X	X	X		
IV.A.4.b.	Bonytail	UDWR/CDOW	Ongoing	X	X	X	X	X	X		
IV.A.4.c.	Humpback chub.										
IV.A.4.c.(1)	Black Rocks Canyon. (Broodstock currently represented by wild fish in the river.)	FWS-FR	Ongoing	X	X	X	X	X	X		
IV.A.4.c.(2)	Westwater Canyon. (Broodstock currently represented by wild fish in the river.)	UDWR	Ongoing	X	X	X	X	X	X		
IV.A.4.c.(3)	Cataract Canyon. (Broodstock currently represented by wild fish in the river.)	UDWR	Ongoing	X	X	X	X	X	X		
IV.A.4.c.(4)	Yampa Canyon. (Broodstock currently represented by wild fish in the river; however, population appears to have declined and Recovery Program is establishing a refuge stock.)	FWS-FR	Ongoing	X	X	X	X	X	X	Biology Committee to recommend disposition of Yampa <i>Gila</i> held at Mumba and Ouray (first must agree on interpretation of genetic analysis which indicated that humpback chubs from the Yampa River appear to be hybridized with roundtail chub, and subsequently, implications for the Yampa River humpback chub population).	
IV.A.4.c.(5)	Desolation/Gray Canyons. (Broodstock currently represented by wild fish in the river; however, population appears to have declined and Recovery Program is establishing a refuge stock.)	UDWR	Ongoing	X	X	X	X	X	X	25 humpback chub from Desolation Canyon were brought into Ouray NFH 2009. Eighteen remain at Ouray NFH.	
IV.A.4.d.	Colorado pikeminnow.										
IV.A.4.d.(1)	Upper Colorado River Basin. (Broodstock currently represented at Dexter NFH and by wild fish in the river.)	FWS	Ongoing	X	X	X	X	X	X		
IV.B.	Conduct annual fish propagation activities.										

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
IV.B.1.	Identify species needs for refugia, research, augmentation, and information and education.	PD	Annual	X	X	X	X	X	X	
IV.B.2.	Implement integrated stocking plan (Nesler et al. 2003).	FWS, UDWR, CDOW	Annual	X	X	X	X	X	X	Generally good production from all 4 facilities; however due to largemouth bass virus testing, bonytail stocking was deferred.
IV.B.3.	Conduct NEPA compliance and develop biological opinion on disposal of excess captive-reared endangered fish.	FWS-ES/FR	Complete	"Disposition of Captive-Reared Endangered CO River Fish," 06/08/95, FONSI.						
IV.C.	Operate and maintain facilities.									
IV.C.1.	Ouray NFH: Randlett Unit.	FWS-FR	Ongoing	X	X	X	X	X	X	
IV.C.2.	Ouray NFH: Grand Valley Unit.	FWS-FR	Ongoing	X	X	X	X	X	X	
IV.C.3.	Wahweap.	UDWR	Ongoing	X	X	X	X	X	X	
IV.C.4.	Mumma.	CDOW	Ongoing	X	X	X	X	X	X	
IV.D.	Plan, design, and construct needed facilities.									
IV.D.1.	Develop Coordinated Hatchery Facility Plan based on revised State stocking plans.	PD	Complete	Wydoski 1994; revised by Czaplak May 31, 2001. See also chapter 4 of Nesler et al., 2003.						
IV.D.2.	Design and construct appropriate facilities.									
IV.D.2.a.	Ouray NFH: Randlett Unit.	FWS/BR	Complete	Ouray NFH water reuse system completed in 2002; hatchery fully functional & is producing razorback sucker for stocking & floodplain experiments.						
IV.D.2.b.	Wahweap.	UDWR/BR	Complete							
IV.D.2.c.	Ouray NFH: Grand Valley Unit.	FWS/BR	Complete	Grand Valley hatchery facility expansion completed in 1999.						
IV.D.2.c.(1)	Construct ponds at Grand Valley to maintain secondary bonytail broodstock, humpback chub from Black Rocks, Westwater and Cataract Canyons, and additional rearing space for razorback sucker (leased ponds being discontinued).	FWS/BR	Pending	X	X					Pond design completed for Grand Valley facility; construction will begin in 2011.
IV.D.2.d.	Acquire ponds for growout of endangered fishes.									
IV.D.2.d.(1)	23 acres of growout ponds in the Green River basin.	FWS/STATES	Complete	As a result of operational changes at Ouray NWR, leased ponds are no						
IV.D.2.d.(2)	100 acres of growout ponds in the Colorado River basin.	FWS/STATES	Complete	As a result of revised state stocking plans, growout pond acreage in the Colorado River basin was judged sufficient to meet required number & size of fish as of 2003. 2010: most leased ponds being discontinued; see IV.D.2.c.(1), above.						The Morse leased pond and Program-owned and free ponds will be retained; others will be discontinued and new Horsethief ponds used, instead.
IV.E.	Conduct monitoring to evaluate effectiveness and continuation of endangered fish stocking.									
IV.E.1.	Assess the monitoring needed to evaluate the contribution to recovery of endangered fish stocking over relevant reaches, life stages, and generations. Assessment addressed in 2001 and 2004 workshops (Upper Colorado River Endangered Fish Recovery Program 2002, 2006); continued assessment ongoing.	LFL/STATES	Ongoing	X	X	X	X	X	X	
IV.E.2.	Evaluate endangered fish stocking and revise augmentation plans, as needed. Initial evaluation complete: Zelasko et al. 2009.	FWS/LFL/ States/PD	Ongoing	X	X	X	X	X	X	Draft report on LFL additional analysis to further evaluate razorback stocking success under the 2003 Integrated Stocking Plan came out in 2010; will be finalized in 2011.
IV.E.3.	Modify stocking plans to ensure successful stocking.	Program	Ongoing	X	X	X	X	X	X	Stocking plan will be updated in 2011 to revise razorback and bonytail numbers, sizes and locations/habitats to be stocked (after it's determined if current data are adequate to produce razorback sucker population estimates). Health Condition Profiling (HCP) being implemented in 2011 to assess overall condition of stocked fish.
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 interagency data management program to compile, manage, and maintain all research and monitoring data collected by the Recovery Program.	FWS-FR	Annual	X	X	X	X	X	X	Migration of PIT-tag database to Access complete.
V.A.1.a.	Develop basinwide razorback monitoring program (implementation to be reflected in sub-basin worksheets)	LFL								X Razorback monitoring plan behind schedule; anticipated in 2011.
V.A.2.	Evaluate population estimates.	PD	Ongoing	X	X	X	X	X	X	
V.A.3.	Collect and submit data according to standard protocol (e.g., location, PIT tag #, length, weight, etc.) on every endangered fish encountered in all field activities in order to provide annual information on population status outside of formal population estimates.	ALL	Ongoing	X	X	X	X	X	X	
V.B.	Conduct research to acquire needed life history information.									

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
V.B.1.	Identify significant deficiencies in life history information and needed research.	PD	Ongoing	X	X	X	X	X	X	X Research Framework study behind schedule; final draft out in 2010 with Biology Committee review/approval scheduled for spring 2011.	
V.B.2.	Conduct appropriate studies to provide needed life history information.	FWS-FR/ STATES	Ongoing	X	X	X	X	X	X		
V.B.2.a.	Evaluate need for imprinting based on reintroduction plans.	FWS-FR	Complete	Reintroduction plans complete; imprinting not called for.							
V.C.	Develop and enhance scientific techniques required to complete recovery actions.										
V.C.1.	Conduct marking study of young-of-the-year Colorado pikeminnow.	FWS-FR	Complete	Muth and Nesler 1989, Haines and Modde 1996, Haines et al. 1998.							
V.D.	Establish sampling procedures to minimize adverse impacts to endangered fishes.										
V.D.1.	Assess electrofishing injury impacts to endangered fishes.	LFL	Complete	See Snyder 2003.							
V.D.2.	Implement scientific sampling protocols to minimize mortality for all endangered fishes.	FWS-ES/ STATES	Ongoing	X	X	X	X	X	X	! Electrofishing equipment and technique standardized for hard-bottom boats completed in 2010 and inflatable boat standardization begun.	
V.E.	Provide for long-term care, cataloging, and accessibility of preserved specimens.	PROGRAM	Ongoing	X	X	X	X	X	X		
V.F.	Assess relative biological importance of tributaries and their potential contributions to endangered fish recovery.	Contract	Complete	Tyus and Saunders 2001.							
V.G.	Reevaluate overutilization for commercial, recreational, scientific or educational purposes and identify actions to ensure adequate protection.	FWS-ES	Ongoing	X	X	X	X	X	X		
V.H.	Reevaluate effects of disease and parasites and identify actions to ensure adequate protection.	FWS-ES	Ongoing	X	X	X	X	X	X		
VI.	INCREASE PUBLIC AWARENESS AND SUPPORT FOR THE ENDANGERED FISHES AND THE RECOVERY PROGRAM. (Includes integration with San Juan River Recovery Implementation Program.)										
VI.A.	Conduct survey to measure public awareness of and attitudes toward endangered Colorado River fishes and the Recovery Program.	PD	Complete 1995.	Vaske 1995.							
VI.B.	Train Recovery Program managers and researchers in media relations.	PD	Ongoing	X	X	X	X	X	X		
VI.C.	Plan and implement information and education and public involvement activities for all significant Recovery Program actions (e.g. presentations, public meetings, public involvement training, etc.).	PROGRAM	Ongoing	X	X	X	X	X	X	! Provided educational materials for the National Boy Scout Jamboree that marked the 100th anniversary of the Boy Scouts of America and drew more than 44,000 attendees.	
VI.D.	Promote technical publication of study results.	PD	Ongoing	X	X	X	X	X	X		
VI.E.	Produce, distribute, and evaluate information and education products (such as newsletter, brochures, public website, etc); manage media relations, including contacting reporters, producing news releases, fact sheets, etc.	PD	Ongoing	X	X	X	X	X	X	Worked with the Community Agriculture Alliance to raise awareness in the Yampa River Basin by participating in 3 of its 4 water forums, including a bus tour. Updates were completed to the public pages of the new website and traffic redirected from old website.	
VI.F.	Participate in development and circulation of interpretive exhibits about the Recovery Program and the endangered fish.	PD	Ongoing	X	X	X	X	X	X		
VI.G.	Maintain Recovery Program technical library and library web page.	PD	Ongoing	X	X	X	X	X	X	PD's office needs to establish protocol to keep CWCB Laserfiche library up to date with new reports.	
VII.	PROVIDE PROGRAM PLANNING AND SUPPORT (PROGRAM MANAGEMENT)										
VII.A.	Determine actions required for recovery.										
VII.A.1	Assure consistency of RIPRAP with currently approved recovery plans.	PD	Ongoing	X	X	X	X	X	X		
VII.A.2.	Recognize the role of the Upper Colorado River Recovery Program in revised recovery plans.	FWS	Ongoing	X	X	X	X	X	X		
VII.A.3.	Update, refine, and prioritize recovery actions (RIPRAP) annually.	PD	Annual	X	X	X	X	X	X		
VII.A.4.	Develop Interim Management Objectives (IMOs) for each species and presumptive stock and an index to population status.	PD	Complete	Lentsch et al. 1998.							
VII.A.4.a.	Public and external peer review of IMOs.	FWS	Complete	1998							
VII.A.4.b.	Implementation Committee review and approval of IMOs.	ALL	Complete	September 10, 1998.							
VII.A.5.	Develop specific recovery goals.										
VII.A.5.a.	Convene Recovery Team.	FWS	Complete	1999							
VII.A.5.b.	Develop recommended recovery goals.	PD/Contract	Complete	2000							
VII.A.5.c.	Biology Committee review of recommended recovery goals.	Program	Complete	2000							
VII.A.5.d.	Finalize recovery goals.	FWS/PD	Complete	U.S. Fish and Wildlife Service 2002a, 2002b, 2002c, 2002d.							

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
VII.A.5.d.(1)	Update recovery goals and then revise recovery plans.	PD/FWS	Pending	X	X	X				Recovery goal timelines in revision, complete revised recovery goal documents by December 2011, then revise recovery plans in 2012 and 2013.	
VII.A.5.e.	Conduct species status review every 5 years.	FWS/Program	Every 5 years	X					X	No change in status proposed. Draft pikeminnow and humpback chub reviews revised and signed by Region 6. Draft razorback sucker and bonytail reviews to Service by summer 2011.	
VII.A.6.	Identify elements of conservation plans to ensure long-term management and protection following delisting.	Program	Ongoing	X	X	X	X	X	X		
VII.A.7.	Monitor and assess Recovery Program accomplishments annually.	PD	Annual	X	X	X	X	X	X		
VII.A.8.	Develop biennial work plan to address priority needs.	PD	Annual	X	X	X	X	X	X		
VII.B.	Actively participate in Recovery Program committees and secure funding for annual work plan and larger projects (e.g., water acquisition, capital construction, and long term operation and maintenance) in accordance with the recovery actions and milestones (Utah, Colorado, Wyoming, Bureau of Reclamation, Fish and Wildlife Service, Western Area Power Administration, Water Users, Environmental Groups, Colorado River Energy Distributors Association and the National Park Service).	PD	Ongoing	X	X	X	X	X	X	Non-federal program partners will continue to seek amendments to PL 106-392 (as well as other, interim options) to extend the period of annual funding at current levels from FY12 to FY23.	
VII.B.1.	As defined in PL 106-392, prepare joint report with San Juan River RIP on the utilization of power revenues for base funding, including recommendations regarding the need for continued base funding after 2011 that may be required to fulfill the goals of the Recovery Programs. Report is due to the committees of the U.S. Senate and House of Representatives 9/30/08.	Program	Complete								Report submitted to Congress by Secretary of the Interior on April 28, 2010. Supplemental information provided by non-Federal Program participants on September 17, 2010, in response to questions and concerns of Representative McClintock.
VII.C.	Manage, direct, and coordinate Recovery Program activities.	PD	Ongoing	X	X	X	X	X	X		
VII.C.1.	Review Information and Education program (Management Committee).	PD	Complete	Management Committee, July 28, 1994.							

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Fish produced and stocked by facility in 2010

Facility	Species	Target	Stocked	Percent
Grand Valley	Razorback sucker	14,895	19,966	134%
Ouray	Razorback sucker	14,895	16,125	108%
Wahweap	Bonytail	10,660	6,780	64%
Mumma	Bonytail	5,330	3,830	72%

Razorback sucker stocked by River

Facility	River	Target	Stocked	Percent
Grand Valley	Upper Colorado	6,620	6,784	102%
	Gunnison	3,310	3,142	95%
	Lower Green	4,965	4,941	100%
Ouray	Middle Green	9,930	10,926	110%
	Lower Green	4,965	5,099	103%

Bonytail stocked by River

Facility	River	Target	Stocked	Percent
Wahweap	Middle Green	2,665	0	0% Testing at Wahweap due to largemouth bass virus at Dexter delayed stocking; Wahweap is "clean" and these fish will be stocked Spring 2011.
	Lower Green	5,330	5,347	100%
Mumma	Colorado	2,665	1,433	54% See above.
	Middle Green	2,665	2,813	106%
	Colorado	2,665	1,017	38% See above.

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)									
I.A.	<u>Green River above Duchesne River</u>									
I.A.1.	Initially identify year-round flows needed for recovery while providing experimental flows.									
I.A.1.a.	Summer/fall.	FWS-ES	Complete	USFWS 1992.						
I.A.1.b.	Winter/spring.	FWS-ES	Complete	Muth, et al. 2000.						
I.A.1.c.	Review summer/fall flow recommendation.	FWS-ES	Complete							
I.A.2.	State acceptance of initial flow recommendations.									
I.A.2.a.	Summer/Fall.	UT	Complete	USFWS 1992 and revised in Muth et al. 2000.						
I.A.2.b.	Winter/Spring.									
I.A.2.b.(1)	Review scientific basis.	UT	Complete	Muth et al. 2000.						
I.A.2.b.(2)	Assess legal and physical availability of water.	UT	Complete							
I.A.3.	Deliver identified flows.									
>*	I.A.3.a. Operate Flaming Gorge pursuant to the 1992 Biological Opinion to provide summer and fall flows.	BR	Complete							
>*	I.A.3.b. Operate Flaming Gorge to supply winter and spring test flows for research.	BR	Complete	Muth et al. 2000.						
	I.A.3.c. Complete NEPA on reoperation of Flaming Gorge pursuant to Biological Opinion and Record of Decision.	BR	Complete	ROD issued February 16, 2006: U.S. Bureau of Reclamation 2006.						
>*	I.A.3.d. Operate Flaming Gorge Dam to provide winter and spring flows and revised summer/fall flows, pursuant to the new Biological Opinion and Record of Decision.	BR	Ongoing	X	X	X	X	X	X	! Operation of Flaming Gorge Dam under the ROD and Biological Opinion is going well. Reclamation's efforts to meet spring flow targets and recommended base flow temperatures in Reach 1 and at the confluence with the Yampa River is commended. In 2010, the request for spring peak flows was 15,000 cfs for 5 consecutive days, there were 18 consecutive days above 15,000 cfs. Reclamation met the Program's base flow request of 2,100 cfs from July 15 to October 1st. The purpose of this base flow release pattern was to disadvantage nonnative species and create better habitat conditions for young pikeminnow. The average flow from July 15 to September 30 was 2292 cfs, which is above average for August and September. Argonne's backwater survey below Jensen showed the 2010's requested base flow of 2100 cfs translated into greater surface area in 5 of 6 of habitats.
	I.A.3.d.1. Conduct real-time larval razorback and Colorado pikeminnow sampling to guide Flaming Gorge operations.	LFL/FWS	Ongoing	X	X	X	X	X	X	
I.A.4.	Legally protect identified flows.									
I.A.4.a.	Protect Summer/Fall flows.									
	I.A.4.a.(1) Hold public meeting to establish future appropriation policy.	UT	Complete 10/94	Utah Division of Water Rights. 1994 (public meetings October 1994; policy November 1994).						
	I.A.4.a.(2) Adopt and implement new policy (new appropriations subject to flow criteria).	UT	Complete 11/94							
>*	I.A.4.a.(3) Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.	UT	Ongoing	X	X	X	X	X	X	
	I.A.4.a.(4) Evaluate effectiveness of policy.	UT	Ongoing	X	X	X	X	X	X	
I.A.4.b.	Protect Winter/Spring flows.									
	I.A.4.b.(1) Hold public meeting to establish future appropriation policy.	UT	Complete							
	I.A.4.b.(2) Identify legal and technical process and schedule for streamflow protection.									
	I.A.4.b.(2)(a) Develop work plan (Utah Department of Natural Resources 2010) and provide annual progress report to Management Committee (mid-November with other Program annual reports).	UT	Ongoing	X	X	X	X	X		Utah's Green River Utah Water Acquisition Team (GRUWAT) provided work plan to develop options for protecting fish flows on the Green River (see new IA4b2a-c, below).
	I.A.4.b.(2)(b) Identify issues, concerns and timeframe.	UT	Complete							
	I.A.4.b.(2)(c) Prioritize potential methods and criteria for flow protection.		In progress	X	X					
	I.A.4.b.(2)(d) Amalgamate technical information needed to model and resolve modeling issues.	UT	In progress	X	X					
	I.A.4.b.(2)(e) Develop model to analyze historic and future scenarios	UT	In progress	X	X					
	I.A.4.b.(2)(f) Analyze model results	UT	Pending		X	X	X			
	I.A.4.b.(2)(g) As necessary, obtain additional authority to protect flows	UT	Pending		X	X	X	X		

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
>*	I.A.4.b.(3) Implement legal streamflow protection.	UT	Pending				X	X			
	I.B. <u>Green River below the Duchesne River</u>										
	I.B.1. Initially identify year-round flows needed for recovery while providing experimental flows.	FWS-ES	Complete	Muth et al. 2000.							
	I.B.2. State acceptance of initial flow recommendations (dependent on development of initial flow recommendations).										
	I.B.2.a. Review scientific basis.	UT	Complete	Muth et al. 2000.							
	I.B.2.b. Assess legal and physical availability of water from Green River and tributaries.	UT	Complete								
	I.B.3. Legally protect identified flows (dependent on development of initial flow recommendations).										
	I.A.4.b.(1) Hold public meeting to establish future appropriation policy.	UT	Complete								
	I.B.3.b. See IA4b2-3, above.	UT	Pending								
	I.C. <u>Price River</u>										
	I.C.1. Determine endangered fish spring through autumn use of the Price River.	UT	Complete	Cavalli 1999.							
	I.C.2. Determine winter use and seasonal flow needs for Colorado pikeminnow in the Price River.	UT/FWS	Pending	X						Draft position paper "Role of the Price River in Recovery of Endangered Fish and the Need for Flow Management" in review (in response to Service BO on Narrows project).	
	I.D. Evaluate and revise as needed, flow regimes to benefit endangered fish populations. See Kitcheyan and Montagne 2005, Bestgen et al. 2006.	FWS/Program	Ongoing	X	X	X	X	X	X		
	I.D.1. Develop study plan to evaluate flow recommendations.	FWS/BOR/ WAPA	Complete								
	I.D.1.a. Evaluate survival of young and movement of subadult razorback suckers from floodplains into the mainstem in response to flows.	TBD	Ongoing	X	X						
	I.D.1.b. Evaluate recent peak flow studies related to floodplain inundation and entrainment of larval razorback suckers.										
	I.D.1.b.(1) Complete final report on entrainment of larval razorback suckers in floodplains.	UDWR/LFL	Complete								
	I.D.1.b.(2) Monitor changes in the magnitude, timing, and size distribution of sediment. (Data series summarizing 2005-2008 daily sediment sampling on Gunnison, Green and Duchesne rivers completed [Williams et al. 2009]; analytical report in review.)	USGS	Ongoing	X						Program Office, WAC and BC reviewed first draft of USGS sediment report on the Gunnison River in Colorado and the Green and Duchesne Rivers in Utah (FR-Sed Mon); second and final review will be done during Feb.2011. Also, the author's MS thesis (in progress) will provide further information on sediment hydraulics on the spawning bar in the Green River.	
	I.D.1.b.(3) Synthesize physical and biological data from recent peak flow studies related to floodplain inundation and entrainment of larval razorback suckers.	LFL	Ongoing							Synthesis draft final report submitted, BC and peer review comments received. Revised final due spring 2011. Authors provide a scientific basis for conclusion that Flaming Gorge spring operations (both timing and magnitude) can be improved, in keeping with the ROD and BO, to better assist in recovery of razorback sucker.	
	I.D.1.c. Monitor larval razorback suckers in mainstem, and synthesize information on drift as related to flows and other conditions.									See to I.D.1.b.(3) above.	
	I.D.1.c.(1) Conduct annual monitoring of larval razorback suckers and analyze historic monitoring data.	FWS/LFL	Ongoing	X	X	X	X	X	X		
	I.D.1.d. Determine relationship of backwater development to sediment availability and peak flows in Reach 2. To be combined with I.D.1.e (4)	LFL/Argonne	Ongoing	X						LFL & Argonne began work on FR-BW SYNTH in late 2009; project delayed due to UDWR computer problem (now resolved). Draft final report due in 2011.	
	I.D.1.e. Evaluate effect of base flow variability on backwater maintenance and quality.										
	I.D.1.e.(1) Conduct annual monitoring of larval Colorado pikeminnow.	LFL	Ongoing	X	X	X	X	X	X		
	I.D.1.e.(2) Monitor age-0 Colorado pikeminnow in backwaters.	UDWR	Ongoing	X	X	X	X	X	X	Pilot study (#158) begun in FY 09 to manage backwaters to advantage native fishes and investigate reasons for poor pikeminnow recruitment continues with some modifications in FY 11.	
	I.D.1.e.(3) Evaluate response of native fish to nonnative predator removal	UDWR	Ongoing	X	X	X	X	X	X		
	I.D.1.e.(4) Integrate biological and physical data on backwaters.	LFL/Argonne	Ongoing	X						UDWR completed their retrospective of Age-0 CPM catch data and correlations with environmental variables in 2011. See I.D.1.d for reference to an ongoing, and more comprehensive synthesis of related data.	
	I.D.1.f. Determine influence of flow and temperature recommendations on entire fish community with emphasis on nonnative fish life history in lower Reach 1 and upper Reach 2.	LFL/FWS	Ongoing	X	X					Project FR-115, "Effects of Flaming Gorge Releases on Lodore/Whirlpool Canyon Fish Community", will follow nonnative fish synthesis reporting schedule.	

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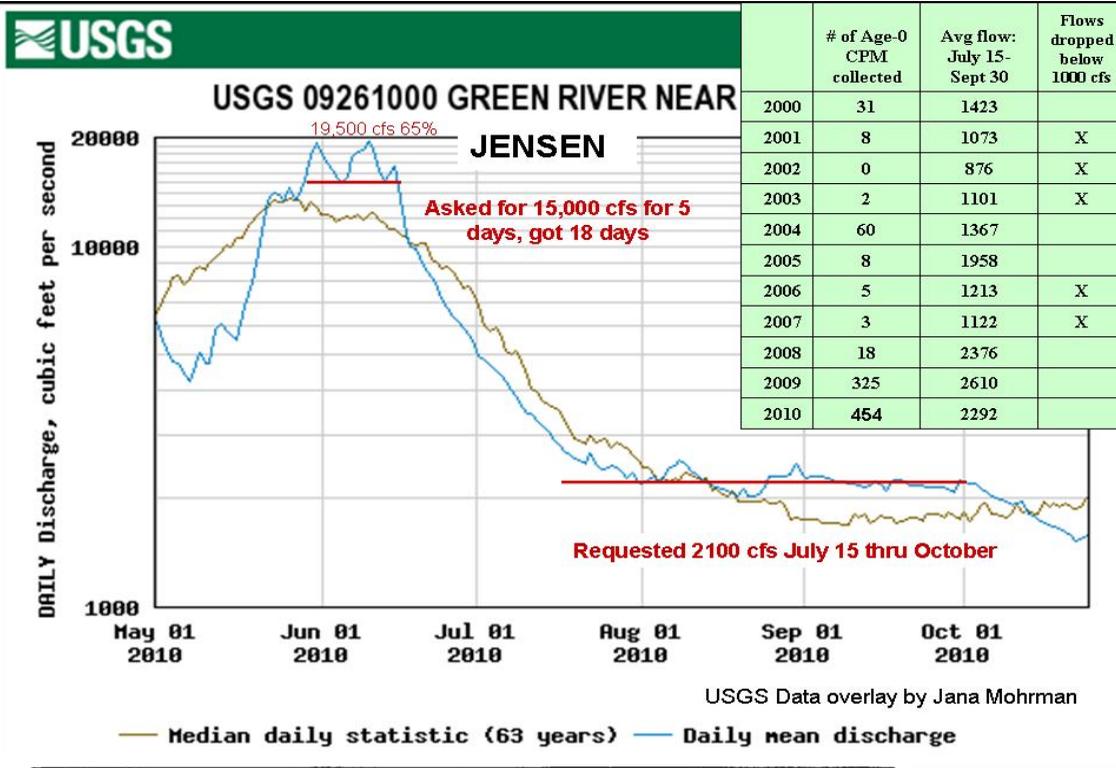
	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
I.D.1.g.	Determine spillway entrainment of nonnative fish at Flaming Gorge Dam.	UDWR	Ongoing	X	X	X	X	X	X	Program relies on UDWR tailrace surveys coupled with Project FR-115 and other studies conducted farther downstream to monitor escapement (UDWR will provide annual data to nonnative fish coordinator). In 2010, Program discovered burbot in Split Mtn Canyon and CSU is investigating provenance of smallmouth bass in Lodore Canyon (Proj C18/19).
I.D.2.	Integrate and synthesize reports for evaluation and recommended revision of flow and temperature recommendations.	PD/FWS	Pending		X				X	On track - As stated in the Green River Study Plan, ongoing syntheses of historical data sets (FR-FP synth and FR-BW synth) will provide critical pieces of information in this evaluation.
I.E.	Assess need for tributary management plan for San Rafael River.									
I.E.1.	Estimate future water demands on San Rafael River.	PD/Utah	Complete							
I.E.2.	Develop tributary management plan for San Rafael River.	State	Pending	X						Utah working on a management plan for the San Rafael.
I.E.3.	Conduct appropriate Section 7 and NEPA compliance to implement tributary management plan.	PD/FWS	TBD							
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)									
II.A.	Restore and manage flooded bottomland habitat.									
II.A.1.	Conduct site restoration.									
II.A.1.a.	Old Charlie Wash.									
>*	II.A.1.a.(1) Construct water control structure and fish kettle.	BR	Complete	Inlet and outlet water control structures repaired and a fish-harvest kettle installed in spring 1995. Inlet structure replaced March 1996. Leaks to outlet structure repaired in 1999.						
	II.A.1.a.(2) Update management plan.	PD	TBD	Need for operational plan TBD pending determination of role of OCV in recovery.						
	II.A.1.a.(3) Monitor and evaluate success.	FWS-FR/BR	TBD							
	II.A.2. Acquire interest in high-priority flooded bottomland habitats between Ouray NWR and Jensen to benefit endangered fish.									
	II.A.2.a. Identify and evaluate sites.	FWS-FR	Complete							
	II.A.2.b. Pre-acquisition planning and identification of acquisition options.	PD	Complete	Six sites acquired (1008.1 acres total). Floodplain acquisition completed and operation, maintenance and evaluation of sites incorporated into Green River Subbasin Floodplain Management Plan (Valdez and Nelson 2004a) (IIA4).						
	II.A.2.c. Conduct appraisal/NEPA compliance.	PD	Complete							
>*	II.A.2.d. Negotiate acquisition and acquire.	PD	Complete							
	II.A.2.e. Evaluate effectiveness of land acquisition activities and provide recommendations.	PD	Complete							
	II.A.3. Implement levee removal strategy at high-priority sites.									
	II.A.3.a. Preconstruction (contaminants screening, floodability assessments, environmental compliance, design, and engineering).	PD/BR	Complete	Levees breached at 8 sites(accessing 274 acres). Levee removal completed and operation, maintenance and evaluation of sites incorporated into Green River Subbasin Floodplain Management Plan (Valdez and Nelson 2004a) (IIA4). See also Birchell et al. 2002.						
>*	II.A.3.b. Construction (levee breaching). [NOTE: Subject to review and approval for depression wetlands.]	BR	Complete							
>*	II.A.3.c. Operate and maintain.	BR/FWS	Complete							
	II.A.3.d. Evaluation.	FWS	Complete							
	II.A.4. Develop Green River Subbasin Floodplain Management Plan	Program	Complete							
>*	II.A.4.a. Implement, validate and refine Green River Subbasin Floodplain Management Plan	Program	Ongoing	X	X	X	X	X	X	! C-6 RZ-RECR: Stirrup remote PIT-tag antennae detected bonytail (11 2007-2009, 5 in 2010), razorback sucker (15 2007-2009, 31 in 2010), and Colorado pikeminnow (13 2007-2009, 6 in 2010). BC visited Green River floodplain sites in 2010. 490 razorback sucker (tl=252mm) from Baeser Bend stocked into Green River in 2010; Baeser will be reset to eliminate nonnatives in 2011 (after one more capture effort).
II.B.	Restore native fish passage at instream barriers.									
II.B.1.	Assess and make recommendations for fish passage at low flows at Tusher Wash.	FWS-FR/ - WR/BR	Complete	Cavalli 2000.						
II.B.2.	Screen Tusher Wash diversion to prevent endangered fish entrainment, if warranted.									
II.B.2.a.	Assess need.	UDWR	Complete	Cavalli 2000, Kitcheyan et al. 2001.						
II.B.2.b.	Design.	BR	Pending		X	X				! In 2010, Dr. Kevin Bestgen (CSU) modeled estimated adult/sub-adult Colorado pikeminnow mortality under different screening options at various flow levels. Literature review of lowhead diversions and screening needed in 2011. Water users still discussing raising the diversion dam, which would affect plans, design, and schedule/funding sources for screen construction.

GREEN RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
>*	II.B.2.c. Construct.	BR	Pending; date TBD				X	X			
	II.C. Enhance water temperatures to benefit endangered fishes.										
	II.C.1. Identify options to release warmer water from Flaming Gorge Reservoir to restore native fish habitat in the Green River.	BR	Complete	USBR 2005.							
	II.D. Support actions to reduce or eliminate selenium impacts at Ashley Creek and Stewart Drain. [NOTE: selenium remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.]	FWS-ES	Ongoing	X	X	X	X	X	X		
	III. REDUCE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)									X! Burbot found for the first time in the Green River below Flaming Gorge this year in Split Mountain Canyon (UDWR immediately extended their must-kill policy to burbot and instituted a week-long burbot "round-up" in Flaming Gorge [January 2011]); walleye captures have increased in upper and lower Green; gizzard shad have been found in lower Green River backwaters and have increased markedly over the past few years in lower Colorado River backwaters. Gizzard shad have the potential to significantly affect food web ecology in backwaters and the mainstem.	
	III.A. Reduce negative impacts to endangered fishes from sportfish management activities.										
	III.A.1. Determine relationship between Flaming Gorge test flows and the fish community in Lodore Canyon..	UDWR	Complete	Bestgen 1997, Bestgen and Crist 2000, F60							
>*	III.A.2. Control escapement of nonnative fishes from Ouray National Wildlife Refuge originating from Pelican Lake.	FWS-RW	Complete	Construction completed prior to spring 1997 runoff.							
>*	III.A.3. Identify and control sources of catfish and centrarchids in the middle Green River.	UDWR	Complete	Jackson and Badame 2002.							
	III.A.4. Develop and implement control programs for nonnative fishes in river reaches occupied by the endangered fishes to identify required levels of control. Each control activity will be evaluated for effectiveness, and then continued as needed. See III.A.2.c.1.& 2. under General Recovery Program Support Action Plan.									Northern pike densities in the Green River remain low. Adult smallmouth bass (>200mmTL) catch rates and population estimates remained at lower levels in Echo Park through Split Mountain, but appeared to increase somewhat throughout the Uintah Basin. In 2011, UDWR will allocate four sampling passes from Split Mountain downstream to Desolation Canyon.	
>*	III.A.4.a. Northern pike in the middle Green River.	UDWR/FWS	Ongoing	X	X	X	X	X	X		
	III.A.4.b. Nonnative cyprinids and centrarchids in nursery habitats.										
>*	III.A.4.b.(1) Small nonnative cyprinids from backwaters and other low-velocity habitats in the lower Green River.	UDWR	On hold	Trammell et al. 2005 report complete; development and implementation of control program on hold.							
>*	III.A.4.b.(2) Small nonnative cyprinids from backwaters and other low-velocity habitats in the middle Green River.	UDWR/FWS	Ongoing	X	X	X				Project 158 continued in 2010 - CRFP Vernal detects small numbers of drifting CPM larvae at lower end of Split Mtn Canyon and good numbers of Age-0 in Reach 2 backwaters. UDWR continued experiments with mechanically removing nonnative cyprinids from backwaters and subsequent block netting to reduce their reinvasion. PI's will again adjust the study plan in 2011 in response to initial results in 2010. 2013 implementation contingent upon available funding.	
>*	III.A.4.b.(3)(2) Smallmouth bass in middle and lower Green River.	UDWR/FWS	Ongoing	X	X	X	X	X	X		
>*	III.A.4.c. Channel catfish (e.g. Deso./Gray Canyons) to protect humpback chub populations, and in the middle Green River to protect razorback sucker and Colorado pikeminnow. On hold pending development of more efficient techniques.	FWS/UDWR	On hold.								
	IV. MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES)										
	IV.A. Augment or restore populations as needed, and as guided by the Genetics Management Plan.										
	IV.A.1. Develop integrated stocking plan for the four endangered fishes in the Green River.										
	IV.A.1.a. Prepare plan.	UDWR	Complete	Nesler at al. 2003.							
	IV.A.1.b. Program acceptance.	UDWR	Complete	Nesler at al. 2003.							
>	IV.A.1.c. Implement plan.	UDWR	Ongoing	X	X	X	X	X	X		

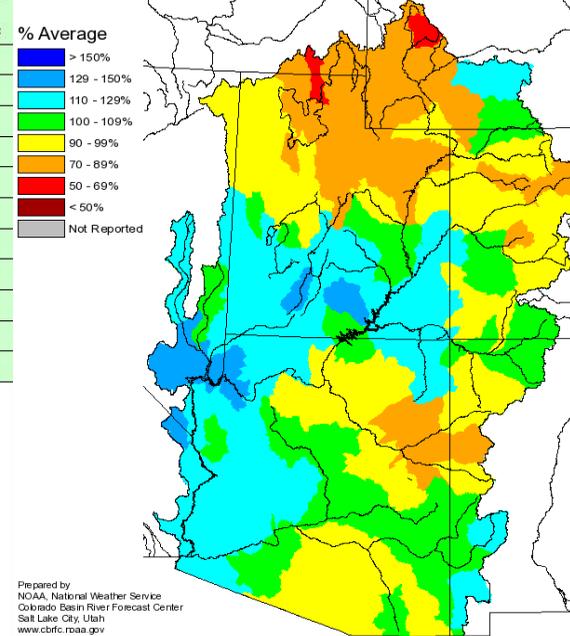
GREEN RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
IV.A.1.c.(1)	Conduct high-priority lab/field studies identified in bonytail reintroduction plan.	UDWR	Draft not accepted; dropped.	Crowl and Rivera 2000.							
IV.A.1.d.	Evaluate stocking success as identified in monitoring plan for stocked fish.	LFL/FWS/ STATES/PD	Ongoing	X	X	X	X	X	X		
V.	MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT)										
V.A.	Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.										
V.A.1.	Verify additional Colorado pikeminnow spawning areas in lower Green.	UT	Complete	Chart et al. 1999.							
V.A.2.	Identify additional razorback sucker spawning areas in lower Green.	UT	Complete	Chart et al. 1999, Muth et al. 1998.							
V.B.	Conduct population estimate for humpback chub.										
V.B.1.	Desolation/Gray. (Sampling occurs in September and October, overlapping fiscal years. Sampling is conducted for 2 years, followed by no sampling for 2 years, with report write-up in the first year following sampling, then sampling resumes in September of the second year). See Jackson and Hudson 2005.	UDWR	Ongoing	X			X	X	X	Five historic/specific sites were sampled in Deso/Gray in 2010, estimates of numbers of humpback chub at each site ranged from 8-41.	
V.C.	Conduct population estimate for Colorado pikeminnow. Sampling is conducted for 3 years, followed by no sampling for 2 years.										
V.C.1	Middle Green River (including Yampa and White rivers). See Bestgen et al. 2005 and 2010.	LFL/UDWR/ FWS	Ongoing	X	X	X			X	! Green R. 2006-2008 population estimate report completed (populations fluctuate, but increasing trend detected). UDWR captured 454 age-0 CPM in backwaters throughout 104 miles of the Middle Green River (highest number since 1991) and an additional 54 age-0 CPM as part of the native fish response study.	
V.C.2	Lower Green River. See Bestgen et al. 2005 and 2010.	LFL/UDWR/ FWS	Ongoing	X	X	X			X	See above.	
V.D.	Complete monitoring plan in FY 11 (based, in part, on recommendations from evaluation of stocked razorback report).	LFL/PD	Pending	X						See General Action Plan, V.A.1.a.	

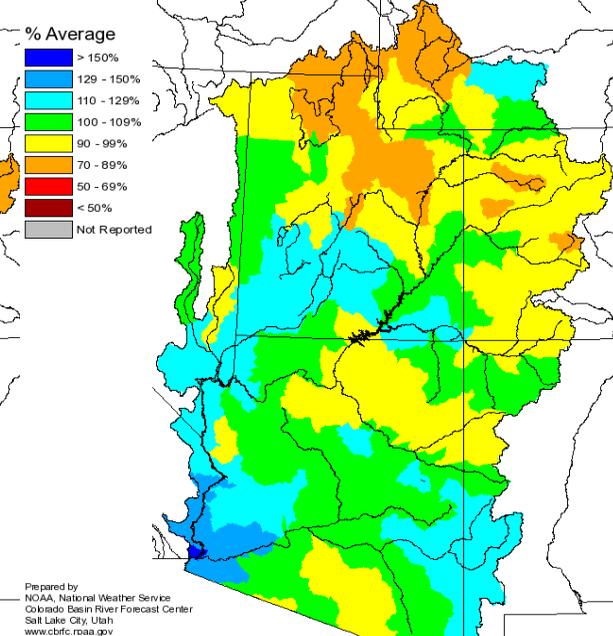


April–July Forecast: Flaming Gorge Inflow/ Hydrologic Category	Muth et al. (2000) Average Base-Flow Magnitudes (cfs), Reach 2	Service’s Proposed Average Base-Flow Magnitudes (cfs), Reach 2
Dry	900–1,100	1,060–1,100
Moderately Dry	1,100–1,500	1,420 to ≥ 1,500
Average	1,500–2,400	2,220 to ≥ 2,400
Moderately Wet	2,400–2,800	2,720 to ≥ 2,800

Seasonal Precipitation, October 2009 - April 2010 (Averaged by Hydrologic Unit)



Seasonal Precipitation, October 2009 - July 2010 (Averaged by Hydrologic Unit)



GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)									
I.A.	Basin-wide activities									
I.A.1.	Identify fish habitat and flow needs									
I.A.1.a.	Complete Phase II feasibility study.	CRWCD/ CWCB/BR	Complete	Hydrosphere 1995b.						
I.A.1.b.	Revise and update estimates of basin water needs.	CRWCD/FWS	Complete	BBC 1998.						
I.A.1.c.	Evaluate and recommend low flow and passage needs (also relates to restoration of fish passage, if needed -- Recovery Element II).	CDOW/FWS/ CRWCD	Complete	Modde et al. 1999.						
I.A.1.d.	Provide hydrology support to develop and evaluate flow augmentation alternatives.	CWCB	Complete	CWCB provided CRDSS model runs to evaluate augmentation water supply alternatives in 2003.						
I.A.1.e.	Report synthesizing the results of water demand, low flow recommendations and hydrologic analyses.	FWS	Complete	Ayres 1999.						
I.A.1.f.	Install, operate, and/or maintain stream flow monitoring gages.	FWS	Ongoing	X	X	X	X	X	X	
I.A.1.g.	Install, operate, and/or maintain sediment monitoring gages.		Complete	Final report 1/05.						
I.A.2.	Develop and implement Yampa River management plan (Roehm 2004).									
I.A.2.a.	Negotiate a Cooperative agreement to implement the Yampa River management plan.	Program	Complete							
I.A.2.a.(1)	Develop a biological assessment for the management plan; initiate intra-Service Section 7 consultation based on the Service intent to enter into the Cooperative Agreement.	FWS	Complete							
I.A.2.a.(1)a	Complete intra-Service consultation, resulting in a programmatic biological opinion (PBO) for the Yampa Basin.	FWS	Complete	January 10, 2005.						
I.A.2.a.(2)	Fulfill NEPA requirements for the management plan.	FWS	Complete	September 2004.						
I.A.2.b.	Sign Cooperative Agreement to implement the management plan.	FWS/Program/ Colorado/ CRWCD	Complete	January 2005.						
I.A.3.	Develop public involvement plan.	FWS/CDOW	Complete	SOW FY 96 and forward.						
I.A.3.a	Implement public involvement plan.	FWS/CDOW	Complete							
I.A.4.	Evaluate and revise as needed flow regimes to benefit endangered fish populations.	FWS/Program	Ongoing	X	X	X	X	X	X	
I.B.	Yampa River above the Little Snake River									
I.B.1	Initially identify year-round flows needed for recovery.	FWS-FR	Complete	Modde and Smith 1995.						
I.B.2	Provide augmentation of low flows.									
I.B.2.a	Identify and acquire water source(s).									
I.B.2.a.(1)	Steamboat Lake.									
I.B.2.a.(1)(a)	Change decree.	CDPOR	Complete 5/97	Done in 1997.						
>* I.B.2.a.(1)(b)	Lease up to 2,000 af. to augment late summer flows.	FWS-WR	Complete	Water is currently available from Elkhead Reservoir and no longer needed from Steamboat Lake.						
I.B.2.a.(1)(c)	Quantify transit losses.	CWCB	Complete	Done in 2000.						
I.B.2.a.(2)	Identify and evaluate water supply alternatives for up to 7,000 af of stream flow augmentation.	Program	Complete	Roehm 2003.						
I.B.2.a.(2)(a)	Complete all necessary administrative, legal, environmental compliance, institutional and financial arrangements needed for development of Elkhead Reservoir enlargement.									
I.B.2.a.(2)(a)i)	Complete environmental compliance.	CRWCD	Complete							
I.B.2.a.(2)(a)ii)	Complete funding agreement.	CRWCD/CWCB	Complete							
I.B.2.a.(2)(a)iii)	Construct	CRWCD	Complete							
>* I.B.2.a.(2)(b)	Deliver water for endangered fish.	Program	Ongoing	X	X	X	X	X	X	! Late summer flows augmented in the Yampa River for the fourth year using releases from Elkhead Reservoir. Minimum instream flow target increased from 93 cfs to 134 cfs. All 5,000 af of Program's 5,000 af pool was released between Sept 1 to Oct 17 at a constant rate of 50 cfs. For experimental purposes, flows averaged 254 cfs (Aug 1 to Oct 31) in order to benefit native fishes and hinder smallmouth bass recruitment. (See graph.) The Elkhead Creek transit study was completed and can be found at: http://pubs.usgs.gov/sir/2010/5198/
I.B.3.	Evaluate need for instream flow water rights.									

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
I.B.3.a	Review scientific basis.	CWCB/CDOW	Complete	Approval of Modde et al. 1999.							
I.B.3.b	Assess legal and physical availability of water.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the work was used as the basis of the allocation of compact water between the							
I.B.3.c	Assess compact considerations.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the work was used as the basis of the allocation of compact water between the							
I.B.3.d.(1)	If necessary, evaluate how identified flows will be legally protected.	CWCB	Pending						X		
I.B.3.e.	Five-year periodic review of progress under the PBO to determine if instream flow filings are necessary.	CWCB/FWS		X					X	By September 30, 2011, as required in the PBO's, the WAC will review mechanisms of current flow protection under the PBO's for the Yampa and Colorado rivers to determine if additional mechanisms or instream flow filings are needed at this time (and this will be reviewed every 5 years).	
I.B.4.	Provide a depletion accounting report as outlined in the Yampa River PBO; including calculation of new depletions every 5 years as a 10-year moving average as determined by CWCB and reported to FWS & CRRIP.	CWCB/FWS	Pending	X					X	! Wyoming submitted the Little Snake River Depletions Accounting Report per pg 3 of Appendix D of the Yampa River PBO on 8/19/10. ! TNC has updated the PBO baseline, 1975-1998, to StateMOD. CO will complete a Watershed Flow Evaluation Tool analysis for the Yampa-White Basin in Jan 2011. CO plans to use StateCU to estimate 1975-2009 annual consumptive use (depletions). Due to changes in state data sets and models, CO expects numbers to change from the Yampa Mgmt. Plan. Therefore, CO will create a Consumptive Uses & Losses Report for 1975-2009, compare those to the old 1975-1998 numbers, and compare their new estimates for 1975-1998 to 1999-2009. The StateCU model will be completed by June 1, 2011; meetings with TNC will be held subsequently to discuss StateMOD. PBO Apx. E text suggests that either the StateCU or StateMOD model can be used (elsewhere the PBO suggests both are needed)	
I.C.	<u>Little Snake River (Colorado and Wyoming)</u>										
I.C.1.	Evaluate importance of Little Snake to endangered fishes and develop management action plan. (Determine if habitat exists to protect under Colorado's instream flow program.)	BR/LFL	Complete	Hawkins et al. 2001; Hawkins and O'Brien 2001.							
I.C.2.	Initially identify year-round flows needed for recovery (needed).										
I.C.2.a.	Develop work plan.	BR/LFL	Complete	Hawkins et al. 2001; Hawkins and O'Brien 2001.							
I.C.2.b.	Identify flows.	FWS-WR	Complete	Hawkins et al. 2001; Hawkins and O'Brien 2001.							
I.C.3.	Evaluate need for instream flow water rights.										
I.C.3.a.	Review scientific basis.	CWCB/CDOW	Complete								
I.C.3.b.	Assess legal and physical availability of water.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the work was used as the basis of the allocation of compact water between the							
I.C.3.c.	Assess compact considerations.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the work was used as the basis of the allocation of compact water between the							
I.C.3.d.	Five-year periodic review of progress under the PBO to determine if instream flow filings are necessary.	CWCB/FWS Wyoming	Pending	X					X	See I.B.3.e, above (but also includes Wyoming SEO).	
I.C.3.d.(1)	If necessary, evaluate how identified flows will be legally protected.	CWCB/ Wyoming	Pending	X					X		
I.C.4.	Assess Wyoming's current and future water needs.	Wyoming	Complete	Assessment of Wyoming's future water needs is completed (see 2001							
I.D.	<u>Yampa River below Little Snake River</u>										
I.D.1.	Initially identify year-round flows needed for recovery.	FWS-FR	Complete	Modde and Smith 1995.							
I.D.1.a.	Modify based on revisions to environmental baseline.	FWS-WR	Complete	Modde and Smith 1995.							
I.D.1.b.	Update flow recommendations to include flows from the Little Snake River.	FWS	Complete	Roehm 2004.							
I.D.2.	Evaluate need for instream flow water rights.										
I.D.2.a.	Review scientific basis.	CWCB/CDOW	Complete								
I.D.2.b.	Assess legal and physical availability of water.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the work was used as the basis of the allocation of compact water between the							
I.D.2.c.	Assess compact considerations.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the work was used as the basis of the allocation of compact water between the							
I.D.2.d.	Five-year periodic review of progress under the PBO to determine if instream flow filings are necessary.	CWCB/FWS	Pending	X					X	See I.B.3.e, above (but also includes Wyoming SEO).	
I.D.2.d.(1)	If necessary, evaluate how identified flows will be legally protected.	CWCB	Pending	X					X		
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)										

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
II.A.	<u>Yampa River from Dinosaur National Monument to Craig, Colorado</u>										
II.A.1.	Restore native fish passage at instream barriers and reduce impacts of maintaining diversion structures.										
II.A.1.a.	Inventory potential barriers.	CRWCD	Complete	Hydrosphere 1995a.							
II.A.1.b.	Determine threshold (passage) flows between Craig and Dinosaur National Monument (low- flow dependent).	CDOW/FWS	Complete	Modde et al. 1999.							
II.A.1.c.	Develop guidelines to facilitate fish passage at new diversion structures.	PD/FWS-ES	Complete	Roehm 2003.							
II.A.2.	Reduce/eliminate entrainment of Colorado pikeminnow at diversion structures.										
II.A.2.a.	Identify and evaluate existing diversion structures for entrainment of Colorado pikeminnow. Hawkins 2009.	PD/FWS-ES	Ongoing	X	X	X				PIT-tag reader will be installed in Maybell Ditch to evaluate entrainment in 2011 and 2012.	
>*	II.A.2.b. Develop and implement remedial measures, as necessary, to reduce or eliminate entrainment.	PD/CDOW/ FWS	TBD								
II.A.2.c.	Develop guidelines to reduce or eliminate entrainment at new diversion structures, if necessary.	PD/CDOW/ FWS	Complete	Roehm 2003.							
II.A.3.	Review NPS/USGS report to assess potential for negative impacts of elevated pH to endangered fish.	Program	Complete	PD's office reviewed Chafin 2002 and agreed elevated pH is a sampling artifact.							
III.	REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)										
III.A.	Develop guidance documents and revise as needed.										
III.A.1.	Develop aquatic management plan (Colorado) to reduce nonnative fish impacts while providing sportfishing opportunities.- CDOW 1998, 2010.	CDOW	Complete	CDOW 2010.							! CDOW completed Yampa River Basin Aquatic Wildlife Management Plan October 2010. Plan characterizes middle and lower Yampa as priority management for native fish (embraces the concept of a native fish conservation area; however, this specific designation is currently unavailable in Colorado and not all agencies recognize the concept).
III.A.2.	Develop Yampa River Nonnative Fish Control Strategy (Program)	Program	Complete								
>*	III.B. Implement CDOW Yampa Basin aquatic wildlife management plan and the Recovery Program's Yampa River Nonnative Fish Control Strategy. Each control activity will be evaluated for effectiveness and then continued as needed. See also III.A.2.c.1.& 2. under General Recovery Program Support Action Plan.	Program/ CDOW	Ongoing	X	X	X	X	X	X		
III.B.1.	Prevent nonnative fish introduction; reduce invasion and recruitment.										
III.B.1.a.	Identify potential conflicts between present fisheries management in existing Elkhead Reservoir and endangered fishes and formulate Elkhead Lake Management Plan.	CDOW	Complete	CDOW 2007.							
III.B.1.a.(1)	Evaluate nonnative fish escapement and control options at Elkhead Reservoir (during and after Elkhead expansion construction). See Miller et al. 2005.	FWS-FR/ CDOW	Ongoing	X						X Researchers report continued escapement of nonnative fish from the enlarged Elkhead Reservoir; based on the 2010 Nonnative Fish Workshop discussions of escapement, source and propagule concerns, the Recovery Program recommended and CDOW agreed to cease translocation of smallmouth bass.	
>*	III.B.1.a.(2) Implement control measures as needed to control escapement (during and after Elkhead expansion construction). Post-construction: monitor and maintain Elkhead screens (YS C-1).	Program	Ongoing	X	X	X	X	X	X		
III.B.1.b.	Evaluate designation of Yampa River downstream of Craig, CO, as a native fish conservation area (YS B-3)	Program/ CDOW		X	X	X	X	X	X		
III.B.1.c.	Remove northern pike and smallmouth bass above Craig, CO (YS C-3)	CDOW	Ongoing	X	X	X	X	X	X	Based on the 2010 Nonnative Fish Workshop discussions, the Recovery Program recommended and CDOW agreed to discontinuing the mark and release pass within the Yampa buffer zone (Hayden to Craig).	
III.B.1.d.	Target spawning areas (YS C-4)										

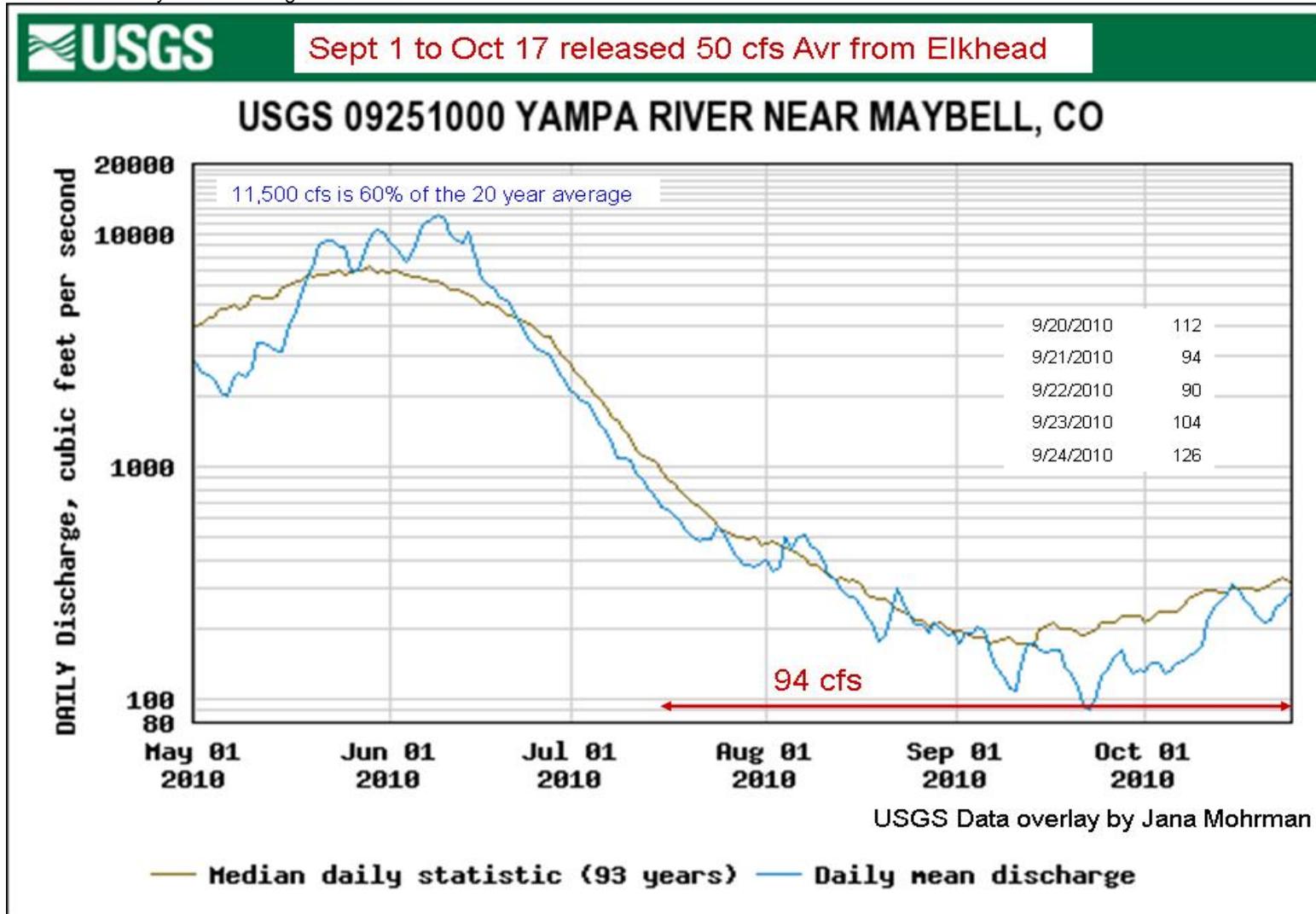
GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
	III.B.1.d.(1) Northern pike.	Program	Ongoing	X	X	X	X		X	X Ongoing northern pike (NP) control efforts have shifted the population size structure to smaller individuals throughout critical habitat on the Yampa River, but the population remains fairly stable. Current density is 21 NP/mile (Craig to Hayden) and 7.9 NP/mile in critical habitat. The interim target for critical habitat is 3 NP/mile (or current pikeminnow density [1.9 pikeminnow/mile in 2008], whichever is lower). CDOW continued efforts to remove NP from Catamount Reservoir and the upper Yampa River mainstem, but so far this work has not yet reduced downstream pike abundance. Program Director's Office recommends additional emphasis on northern pike control above Hayden.	
	III.B.1.d.(1)(a) Identify and evaluate natural and artificial spawning/nursery habitats for northern pike in the Yampa River for exclusion devices.	CDOW	Complete	Hill 2004.							
>*	III.B.1.d.(1)(b) Implement remedial measures to reduce pike reproduction in Yampa River.	CDOW	Ongoing	X						CDOW continues to modify connected slackwater habitats to hinder northern pike reproduction in the upper Yampa River. Reclamation determined that a large permanent berm at RM 151 was not feasible due to local channel dynamics; other options are being investigated.	
	III.B.1.d.(1)(c) Develop guidelines for new structures to minimize creation of habitat suitable for pike spawning/nursery.	CDOW	Ongoing	X							
>*	III.B.1.(d)(2) Smallmouth bass	Program	Ongoing	X	X	X	X		X	In 2010 adult smallmouth bass (>200mmTL) densities in Little Yampa Canyon were 57 fish/mile and 100 fish/mile in Lily Park, an increase over 2009. A strong juvenile cohort (spawned in 2007) entered the adult size class in 2010. ! Researchers revised 2010 SOW's to concentrate efforts on removal of spawning adults ("the surge") and will further extend efforts into the spawning season in 2011 (see General III.A.2.c.). Also similar to observations on the Green River and as was observed in 2008 and 2009, smallmouth bass reproduction in the Yampa River drainage was delayed in 2010 due to relatively wet hydrology.	
	III.B.1.e. Assess food web/contaminant impacts of nonnative aquatic species in the Yampa River.	TBD	Pending		X	X				Program Director's office recommends supporting work outside the Program to implement pilot trophic stable isotope analyses (tissue sampling). A massive shift in energy flow away from native species to invasive species (e.g., crayfish and smallmouth bass) is suspected (if validated, this would support the need to prevent similar ecological impacts in other parts of the basin). Part of this work will include exploring role of crayfish in mobilizing mercury into the food web (which may have negative implications for endangered fish reproduction).	
	III.B.2. Control nonnative fishes via mechanical removal										
	III.B.2.a. Estimate nonnative abundance, status, trends & distribution (YS I-3)	Program	Ongoing	X	X	X	X	X	X		
	III.B.2.b. Develop and refine nonnative fish removal criteria (YS K-1)	Program	Ongoing	X	X	X	X	X	X		
	III.B.2.c. Identify and evaluate gear types and methods to control nonnative fishes (YS I-5)	Program	Ongoing	X	X	X	X	X	X		
>*	III.B.2.d. Remove and translocate northern pike from Yampa River. See Hawkins et al. 2005. (YS J-1)	CDOW/FWS	Ongoing	X	X	X	X	X	X		
>*	III.B.2.e. Remove (formerly "and translocate") smallmouth bass. (YS J-1)	CDOW	Ongoing	X	X	X	X	X	X	! Based on the 2010 Nonnative Fish Workshop discussions of escapement, source and propagule concerns, the Recovery Program recommended and CDOW agreed to cease translocation of smallmouth bass.	
	III.B.2.f. Control channel catfish										
>*	III.B.2.f.(1) Remove channel catfish in Yampa Canyon. (Discontinued except for removal of very large individuals incidental to smallmouth bass removal)	FWS	Dis-continued								
>*	III.B.2.f.(2) Remove channel catfish >400mm in -Yampa Canyon.	FWS	Ongoing	X	X	X	X	X	X	Catfish >400mm are being removed as part of smallmouth bass removal efforts in Yampa Canyon.	
	III.B.2.g. Develop and refine native fish response criteria (YS K-2)	Program	Complete								
	III.B.2.h. Monitor native and endangered fish response (YS L-2)	Program	Ongoing	X	X	X	X		X		

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
III.B.2.i.	Remove bag and possession limits on warmwater nonnative sportfishes within critical habitat in Colorado.	CDOW	Complete	In Colorado fishing regulations.						
IV.	MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES)									
IV.A.	Yampa River in Dinosaur National Monument									
IV.A.1.	Augment or restore populations as needed, and as guided by the Genetics Mgmt. Plan.									Capture of additional age-0 <i>Gila</i> for captivity on hold pending NEPA and revision of <i>Gila</i> management plan. See also General Action Plan, IV.A.4.c.(4).
IV.A.1.a.	Develop integrated stocking plan for bonytail in the Yampa River.	CDOW	Complete	Nesler et al. 2003						
> IV.A.1.a.(1)	Implement stocking plan.	FWS/CDOW	Ongoing	X	X	X	X	X	X	
IV.A.1.b.	Research the survivability of young-of-year <i>Gila</i> species in transport and hatcheries.	FWS/CDOW	Complete							
IV.A.1.c	Evaluate stocking success as identified in monitoring plan for stocked fish.	LFL/FWS/ States/PD	Ongoing	X	X	X	X	X	X	
V.	MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT)									
V.A.	Conduct population estimate for humpback chub. (Estimate/trend information will be obtained via CPUE during nonnative fish removal passes.)	FWS	Ongoing	X	X	X	X	X	X	<i>Gila</i> species catch rate during smallmouth bass removal increased in 2010.

Elkhead Reservoir endangered fish pools will be managed to ensure minimum flows of at least 93–134 cubic-feet-per-second (cfs; preferably 120 cfs or greater) at the Maybell gage during August–October. A caveat to that is the Recovery Program may request other release scenarios to support research and management actions deemed appropriate to assist in recovery of the endangered fishes.



GREEN RIVER ACTION PLAN: DUCHESNE RIVER

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)									
I.A.	Identify initial year-round flows needed for recovery.	FWS-ES	Complete	Initial year-round flow needs for recovery were identified & summarized in a letter to Program Director on 03/09/95 and included in 1998 biological opinion.						
I.A.1.	Conduct hydrology/water availability study.	UT	Complete	CH2MHill 1997.						
I.A.2.	Conduct follow-up study to evaluate and refine flow recommendations.	FWS/UT	Complete	Modde and Keleher 2003.						
I.B.	State acceptance of initial flow recommendations (dependent on development of initial flow recommendations).									
I.B.1.	Review scientific basis.	UT	Complete	Acceptance of Modde and Keleher 2003.						
I.B.2.	Assess legal and physical availability of water.	UT, CUWCD, FWS	Ongoing	X	X					Progress has been made since the BO; however, a water management report (chronicling how the flow recommendations have been met over the past 5 years, describing the yearly efforts, available water and evolution of past operations [release triggers, etc.]) is the next step necessary in the process of acquiring more water. This water management report replaces the "water management plan" that the 2005 Biological Opinion called for by December 2009. CUWCD has produced a draft report, and the Service and other DRWG members will review and amend the document to finalize at the end of 2011. The DRWG is still investigating ways to find additional water for delivery.
I.C.	Legally protect and deliver identified flows.									
I.C.1.	Strawberry Valley Project.									
I.C.1.a.	Determine amount of water available from the Strawberry Valley Project for fish use. (BR/CUWCD completed coordinated reservoir operations model in 2003. Task completion part of I.D.1) (This is part of the coordinated reservoir operation in I.D.)	USBR/DOI/PD/ Strawberry Water Users	Ongoing							
I.C.2.	Management of Daniels Transbasin Diversion.									
I.C.2.a.	Determine the amount of water available from the Daniels Diversion for endangered fish use and pattern and location for delivery. (BR/CUWCD completed coordinated reservoir operations model in 2003. Task completion part of I.D.1)	DOI/IBAT/FWS/ Mitig. Comm./ CUWCD/ UteTribe	Complete							
>* I.C.2.b.	Develop agreements if feasible to deliver and protect water available from the Daniels Diversion.	UT/IBAT /FWS/DOI/ Mitig.Comm./ CUWCD	TBD							! 2,900 af available, but formal agreements may not be necessary because the DRWG is attempting to meet the flow recommendations with voluntary participation. An additional 1,500 af/year has been made available for five years beginning in 2011 to assist in meeting target flows (water users and DOI could choose to extend this in 5-year increments, depending on other demands).
I.D.	Coordinate reservoir operation.									
I.D.1.	Determine feasibility and benefits of coordinated reservoir operation.	BR/CUWCD/ DOI	Complete	Hansen 2004.						
>* I.D.2.	Develop agreements if feasible to coordinate reservoir operations and protect flows to the Green River.	BR/CUWCD/ UT/Ute Tribe	Ongoing	X	X	X	X	X	X	There are concerns that guidelines for strict reservoir operations may hurt the DRWG's current flexibility and weaken their success. The DRWG will continue to evaluate the need for this.
>* I.D.2.a.	Rehabilitate Myton Town diversion.	BR/CUWCD/ UT/Ute Tribe	Complete	The diversion has been rehabilitated. Note: UDWR is working with FWS and Ute Tribe on plans to modify the diversion to allow fish passage under the Three Species Plan. A CCAA/SHA is being developed and will be presented to water users this spring. Fish passage design will be completed after the CCAA/SHA are finished. This Myton Diversion project has been nominated as one of the ten "waters to watch" under the National Fish Habitat Action Plan.						
I.E.	Examine the feasibility of other options for obtaining water.	BR/DOI/PD/ UteTribe	Ongoing	X	X	X	X	X	X	Now that Myton is rehabilitated, the DRWG will be more closely managing water to meet the flow recommendations as well as determining what additional water may be needed. This will be further evaluated in the water management plan.
I.F.	Determine need and feasibility of additional gaging.	BR/FWS/UT	Complete							

GREEN RIVER ACTION PLAN: DUCHESNE RIVER

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
I.F.1.	Construct additional gages, as needed.	TBD	Complete								
I.G.	Evaluate and revise as needed, flow regimes to benefit endangered fish populations	FWS/Program	Ongoing	X	X	X	X	X	X	! Initial analysis shows that flow recommendations are improving flows for fish. Not yet enough information for revision or review of the Duchesne River Flow Recommendations. A few more years of operating with Myton Diversion rehabilitated will be needed before analyzing success. (Note: this will include operations with fish passage at the structure as well.)	
III.	REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)										
III.A.	Reduce negative interactions between nonnative and endangered fishes.										
III.A.1.	Identify most damaging nonnative fishes.	UDWR	Complete	Hawkins and Nesler 1991, Lentsch et al. 1996b, Tyus and Saunders 1996. Johnson et al. 2008.							
III.A.2.	Assess options to control negative interactions from nonnative fishes from the Duchesne River to benefit Colorado pikeminnow and razorback sucker young-of-the-year.	UDWR	Complete	Tyus and Saunders 1996.							
III.A.3.	Implement and evaluate the effects of viable measures to control negative interactions from nonnative fishes. (See III.A.3. under Green River Mainstem Action Plan.)										
III.A.3.a.	Evaluate feasibility of screen on Bottle Hollow Reservoir to control nonnative fish escapement and explore alternative funding sources.	FWS-FAO/Ute Tribe/BOR	Complete	USFWS 2001.							
>*	III.A.3.a.(1) If feasible and necessary, screen Bottle Hollow Reservoir	Ute Tribe	Complete	Elder's Pond screen (downstream of Bottle Hollow) completed in 2002 (Irving and Montoya 2002).							
III.A.3.b.	Evaluate escapement of nonnative fishes from Starvation Reservoir and the feasibility of screening.	UDWR	Complete	The UDWR 2007 report determined that screening Starvation was not cost-effective based on the low rate of escapement. However, nonnative escapement from Starvation may need to be re-evaluated because new isotopic analysis (presented at the Recovery Program researchers meeting by Brian Wolf, CSU) indicates that all walleye caught in the Green River have Starvation markers. Relative to other Program priorities, screening may still rank fairly low.							
III.A.3.b.(1)	If feasible and necessary, screen Starvation Reservoir	N/A	May need to be revisited								
>*	III.A.3.c. Remove nonnative fish (smallmouth bass, channel catfish and northern pike). See III.A.2.c.1. & 2. under General Recovery Program Support Action Plan.	FWS-FR/Ute Tribe	Ongoing	X	X	X	X	X	X	Ute Tribe implementing nonnative fish removal on the Duchesne (in-kind support).	

GREEN RIVER ACTION PLAN: WHITE RIVER

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)										
I.A.	Assess need for tributary management plan for the White River.	PD	TBD								
I.A.1.	Estimate future water demands on the White River.	TBD	TBD							Colorado has been working on this through Roundtables/SWSI.	
I.B.	Initially identify year-round flows needed for recovery.										
I.B.1.	Develop work plan.	FWS-FR	Complete	Lentsch et al. 2000.							
I.B.2.	Identify flows. Initial report complete (Irving et al. 2004).	FWS-FR	Pending	X						X Program Director's staff is revising the White River flow recommendations (Irving et al, 2004); expects to provide a draft to the Biology Committee by April 15, 2011.	
I.B.3.	Develop and implement a White River management plan	Program			X	X					
I.B.3.a.	Conduct programmatic Section 7 and NEPA compliance on recovery actions and a level of future water demand.	FWS			X	X				Service will begin developing a programmatic biological opinion for the White River after White River flow recommendations are completed and development of a management plan gets underway.	
I.C.	Evaluate how identified flows will be legally protected.	CWCB	Pending								
I.D.	State acceptance of initial flow recommendations (dependent on development of initial flow recommendations).										
I.D.1.	Review scientific basis, dependent on development of flow recommendations by FWS.	UT/CO	Pending								
I.D.2.	Assess legal and physical availability of water.	UT/CO	Complete	No work has been done in Utah on water availability. CO completed work on a water availability study for the White River in early 1995 & the work was used as the basis for developing depletion schedules for the White River.							
I.D.3.	Assess impacts of depletions on Colorado's Compact allocations.	CWCB	Complete	CO completed work on a water availability study for the White River in early 1995 & the work was used as the basis for developing depletion schedules for the White River.							
I.D.4.	CWCB notice of intent to appropriate (in Colorado).	CWCB	On hold								
I.E.	Legally protect identified flows (dependent on development of initial flow recommendations).										
I.E.1.	Protect flows in Colorado.										
I.E.1.a	Appropriate.										
I.E.1.a.(1)	CWCB approval to appropriate.	CWCB	On hold								
>* I.E.1.a.(2)	Colorado Attorney Generals Office file date.	CWCB	On hold								
>* I.E.1.a.(3)	Water court adjudication (litigation dependent).	CWCB	On hold								
I.E.2.	Protect flows in Utah.										
I.E.2.a.	Hold public meeting to establish future appropriation policy.	UT	Complete								
I.E.2.b.	Identify legal and technical process and schedule for streamflow protection.	UT	Pending	X							
>* I.E.2.c.	Implement process for streamflow protection.	UT	Pending	X	X	X				! In January 2011, Utah conditioned a new water right application to protect endangered fish baseflows.	
I.F.	Evaluate and revise as needed flow regimes to benefit endangered fish populations.	FWS/Program	Ongoing	X	X	X	X	X	X		
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)										
II.A.	Restore native fish passage at instream barriers.										
II.A.1.	Assess and make recommendations for fish passage at Taylor Draw.	PD	Complete	Taylor Draw fish passage recommendations completed in 1997 when Program determined costs exceeded benefits. Irving 1997.							
III.	REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)										
III.A.	Reduce negative interactions between nonnative and endangered fishes.										
III.A.1.	Monitor escapement of nonnative fishes from Kenney Reservoir (especially black crappie and channel catfish).	CDOW	TBD	Initial assessment completed. If fish stocked in the future, escapement will need to be monitored. Elmsblad 1998.							
III.B.	Reduce negative impacts to endangered fishes from sportfish management activities.										
III.B.1.	Assess adequacy of current regulations and options (including harvest) to reduce negative impacts on native fishes from nonnative sportfish and options to reduce angling mortality on native fishes below Kenney Reservoir.	CDOW	Complete	CDOW completed sportfish regulation/angling regulation changes in 1997 (See Colorado fishing regulations).							
III.B.1.a.	If necessary, assess management options to reduce escapement of black crappie from Kenney Reservoir.	CDOW	Complete	CDOW completed assessment (CDOW 2001).							

GREEN RIVER ACTION PLAN: WHITE RIVER

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
III.B.2.	Preclude new nonnative species introductions, translocations or invasions to preserve native species dominance within critical habitat.	Program	Pending	X	X	X	X	X	X	This topic also will be addressed in the draft Nonnative Fish Strategy.	
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.									UDWR's work under Three Species Plan finding good populations of roundtail, flannelmouth and bluehead suckers, and the first recorded age-0 Colorado pikeminnow was captured this year (50 miles upstream of the mouth). A White River Technical Advisory Group is meeting to determine native fish priorities for the White River in Utah (precipitated by finding Colorado pikeminnow and the pending flow recommendations). The Group is developing a White River Conservation Plan.	
V.A.1.	Determine relative abundance and fate of Colorado pikeminnow congregation below Kenney Reservoir.	FWS-FR	Complete	Elmblad 1997.							
V.A.2.	Monitor the White River fish community downstream of Kenney Reservoir to determine long-term effects of mainstream impoundment on the White River.	FWS-FR	Complete	Elmblad 1997.							

COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)										
I.A.	Colorado River above Gunnison River										
>*	I.A.1. Develop, issue and implement PBO.	FWS	Complete	USFWS 1999b.							
	I.A.2. Initially identify year-round flows needed for recovery.										
	I.A.2.a. Rifle to Roller Dam.	FWS-FR	Complete	Osmundson 2001.							
	I.A.2.b. Roller Dam to 15-Mile Reach.	FWS-FR	Complete	Osmundson 2001.							
	I.A.2.c. 15-Mile Reach.	FWS-FR	Complete	Osmundson and Kaeding 1991.							
	I.A.3. Provide a depletion accounting report as outlined in the 15-Mile Reach PBO.										
	I.A.3.a. Collect data.	CWCB/FWS-ES/BR	Ongoing	X	X	X	X	X	X		
	I.A.3.b. Develop consumptive use and losses report with CRDSS model to verify level of depletions.	CWCB	Complete								
	I.A.3.c. Calculate new depletions every 5 years (2006-2010, etc).	CWCB	Pending	X	12/31/2011					X	
	I.A.4. Evaluate need for instream flow water rights.										
	I.A.4.a. Rifle to Roller Dam (Dependent on initial flow recommendations).										
	I.A.4.a.(1) Assess legal and physical availability of water.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the							
	I.A.4.a.(2) Assess impacts of depletions on Colorado's Compact allocations.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the							
	I.A.4.a.(3) Five-year periodic review of progress under the PBO to determine if instream flow filings are necessary.	CWCB/FWS		X						X	
	I.A.4.a.(3)(a) If necessary, evaluate how identified flows will be legally protected.	CWCB	On hold								
	I.A.4.b. Roller Dam to 15-Mile Reach (Dependent on initial flow recommendations).										
	I.A.4.b.(1) Assess legal and physical availability of water.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the							
	I.A.4.b.(2) Assess impacts of depletions on Colorado's Compact allocations.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the							
	I.A.4.b.(3) Five-year periodic review of progress under the PBO to determine if instream flow filings are necessary.	CWCB/FWS	On hold	X						X	
	I.A.4.b.(3)(a) If necessary, evaluate how identified flows will be legally protected.	CWCB	On hold								
	I.A.4.c. 15-Mile Reach.										
	I.A.4.c.(1) Instream flow water right secured - 581 cfs (July - September).		Complete	On September 2, 1997, instream flow water rights were decreed for 581 and 300 cfs to benefit endangered fishes in the 15-Mile Reach. These water rights have a priority date of the date file which is December 1992 and							
	I.A.4.c.(2) Irrigation season return flows legally protected - 300 cfs.		Complete								
	I.A.5. Provide and legally protect instream flows pursuant to Colorado River PBO.										
										/ Base flow augmentation for the 15-Mile Reach began on July 21, with the average flow target of 1,240 cfs, by mid August the target dropped to 1000 cfs. A total of 102,994 af was added to baseflow in water year 2010 this included 52,032 af from Green Mountain (assisted by Grand Valley Water Management), 19,263 af from Ruedi, 4,872 af from Williams Fork, 7,572 af from Wolford Mountain Reservoir, and 13,760 af from the Palisade Bypass Pipeline (see Assmt-CR worksheets). Coordination of this group is made by meeting twice a year with Grand Valley water users, twice a year with the town of Basalt and a meeting with the HUP group in Glenwood in addition to conducting conference calls as needed to discuss river conditions prior to the weekly HUP calls.	
>*	I.A.5.a. Pursuant to Ruedi Biological Opinion (and subsequently, the 15-Mile Reach PBO), deliver 5,000af annually & an additional 5,000af 4 out of 5 years (ongoing and protect by short-term agreement).	BR/CWCB	Ongoing	X	X	X	X	X	X	See I.A.5., above.	
>*	I.A.5.b. Execute lease (through 2012) for Reclamation's 10,825 af from Ruedi Reservoir.	BR/FWS/CWCB	Complete	2012 lease signed June 23, 2003.							Program still struggles to meet flow recommendations in drought years; FWS and Reclamation may explore opportunities (and would include Colorado and the River District in these discussions) to continue delivering this water (or a portion thereof) after 2012.
>*	I.A.5.b.(1) Provide water annually pursuant to long-term lease.	BR/CWCB	Ongoing through 2012.	X	X						
	I.A.5.c. East and West slope water users provide 10,825 af pursuant to 15-Mile Reach PBO										

COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
	I.A.5.c.(1) Provide 10,825 af on an interim basis from Wolford and Williams Fork reservoirs.									
	I.A.5.c.(1)(a) Execute 10-year agreement for delivery of 5,412.5 af by West Slope water users. Extend agreement through 2013.	CRWCD/FWS	Complete	Pursuant to the 1995 FBO, in 2000, the Service signed a 10-year agreement with the CRWCD for delivery of 5,412 acre-feet of West Slope water from Wolford Mountain Reservoir (in addition to the original commitment of 6,000						
>*	I.A.5.c.(1)(a)(i) Provide and protect water deliveries by West Slope water users.	CRWCD/ CWCB	Ongoing	X	X	X				See I.A.5., above. We still deliver Wolford water and drought backup water in Ruedi.
	I.A.5.c.(1)(b) Execute 10-year agreement for delivery of 5,412.5 af by East Slope water users. Extend agreement through 2013.	DWD/FWS	Complete	Pursuant to the 1995 FBO, in 2000, the Service signed a 10-year agreement with Denver Water to deliver of 5,412 acre-feet of East Slope water from Williams Fork Reservoir.						
>*	I.A.5.c.(1)(b)(i) Provide and protect water deliveries by East Slope water users.	DWD	Ongoing	X	X	X				See I.A.5., above. Currently deliver water from Williams Fork, but this is expected to come from Lake Granby in the future.
	I.A.5.c.(2) Provide permanent delivery of 10,825 af in late summer/early fall to meet base flow needs.									
	I.A.5.c.(2)(a) Identify options.	Water Users	Complete	Water Users 2002.						
	I.A.5.c.(2)(b) Select preferred alternative for delivery.	Water Users	Complete							The final EA and FONSI for the "Lake Granby-Ruedi" 10,825 is anticipated to be completed in the fall of 2011; interim 10,825 being delivered.
	I.A.5.c.(2)(c) Sign agreement(s) for permanent delivery of 10,825.	Water Users	Pending							! Existing 10-year (interim) agreements (see I.A.5.c.&d.) that expired July 1, 2010 were extended in July of 2010 through 2013 (with option for 2 more years until permanent 10825 is finalized). Delivery of permanent 10825 may occur as early as summer 2013.
>*	I.A.5.c.(2)(d) Deliver and legally protect flows.	Water Users	Pending			X	X	X	X	
	I.A.5.d. Evaluate options for use of uncommitted Ruedi Reservoir water following Round II sales.	BR	Complete	On May 20, 1999, FWS issued final amendment to BO for Round II water sales. Reclamation agreed to implement a 15-year contract for 21,650 af (in addition to the original 5,000 of + 5,000 of four out of five years). USFWS						
	I.A.5.e. After Ruedi Round II water sales are completed, or commitments to contracts agreed to, resolve the disposition of remaining uncommitted water from Ruedi Reservoir.	BR/CWCB/ FWS	Complete	1999 amendment to 1995 Ruedi BO. USFWS 1999a.						
>*	I.A.5.f. Pursuant to Wolford Mountain (Muddy Creek) Biological Opinion, deliver up to 6,000 acre-feet of water.	CRWCD/FWS/ CWCB	Ongoing	X	X	X	X	X	X	See I.A.5., above.
	I.A.5.g. Coordinated reservoir operations.									
	I.A.5.g.(1) Evaluate (final report). Implementation plan finalized 2/28/06.	BR	Complete	Identified as complete in 2000 version of RIPRAP.						
>*	I.A.5.g.(2) If available, deliver additional peak flows, evaluate process & hydrology, and provide annual report.	BR	Ongoing	X	X	X	X	X	X	! Due to rapid snowmelt, spring 2010 saw the highest coordinated peak flow release (73,971 af) since 1997 when CROS began (See graph and table.)
	I.A.5.h. Collbran Project.									
	I.A.5.h.(1) Evaluate.	BR	Complete	Collbran contract could not be implemented as planned due to a number of						
	I.A.5.h.(2) Make recommendations	BR	Complete	water rights issues.						
	I.A.5.i. Silt Project.									
	I.A.5.i.(1) Evaluate.	BR	Complete	Not feasible due to water availability.						
	I.A.5.i.(2) Make recommendations.	CDOP/BR	Complete							
	I.A.5.j. Grand Valley Water Management Project.									! Diversions reduced by 24,001 af and 20,617 af returned through Palisade pipeline in water year 2010.
	I.A.5.j.(1) Evaluate.	BR	Complete	1996						
	I.A.5.j.(2) Complete Draft Grand Valley Water Management Environmental Assessment. The agreement to deliver Green Mountain Reservoir water to the Grand Valley Power Plant, pursuant to the Orchard Mesa Check Settlement, will also be covered in this draft environmental assessment.	BR	Complete	1997						
>*	I.A.5.j.(3) Design and construct features of the Grand Valley Water Management Project.	BR	Complete							
	I.A.5.j.(4) Execute agreement for delivery of surplus Green Mountain Reservoir water up to the excess capacity of the Grand Valley Power Plant pursuant to the Orchard Mesa Check Settlement.	BR	Complete	July 1999.						
	I.A.5.j.(5) Execute agreement (municipal water contract) to deliver additional Orchard Mesa Check Settlement water and Grand Valley Water Management Plan water to benefit endangered fish.	BR/City of Grand Jct.	Complete; renew in 2012.	In 2000, Reclamation entered a 5-year contract to deliver Green Mountain surplus water to the city of Grand Junction for municipal/recreational purposes. Renewed on 8/29/2007 through 12/31/2012.						
	I.A.5.j.(6) Assess options and legally protect only additional Orchard Mesa Check Settlement water and Grand Valley Water Management Plan water.	BR	Complete	1999						
	I.A.5.k. Orchard Mesa Irrigation District (OMID) Canal Automation Project									

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
I.A.5.k.(1)	Secure site for re-regulating reservoir	CRWCD	Complete	2009							
I.A.5.k.(2)	Develop acceptable cost-sharing agreement for escrow account to fund O&M costs.			X						/ Re-regulating reservoir site secured. OMID, CWCB, River District and Reclamation nearing final draft of cost-share agreement.	
I.A.5.k.(3)	Conduct environmental assessment			X							
>* I.A.5.k.(4)	Design and construct features of the OMID project			X	X	X	X				
I.A.5.l.	Water Division 5 Coordinated Facilities Study (CFOPS).										
I.A.5.l.(1)	Evaluate options for providing and protecting additional peak flows to the 15-Mile Reach. Phase I completed 2001; Phase II completed 2003 (Brown and Caldwell 2003).	CWCB	Ongoing	X						X Completion of CFOPS Phase III on hold, waiting for 2008-2009 annual CROS reports (anticipated March 31, 2011). Anticipate final CFOPS report by September 30, 2011.	
>* I.A.5.l.(2)	Deliver additional peak flows as determined feasible in the evaluation.	TBD	Ongoing	X	X	X	X	X	X		
I.A.6.	Review implementation of RIPRAP items to determine timely compliance with applicable schedules (every 2 yrs. Beginning in 2003).	FWS	Ongoing	X		X		X	X		
I.B.	Colorado River from the Gunnison to the Colorado-Utah State line (Includes the 18-Mile Reach										
I.B.1.	Initially identify year-round flows needed for recovery.	FWS-FR	Complete	McAda 2003.							
I.B.2.	Evaluate how identified flows will be legally protected.	CWCB	On hold								
I.B.3.	State acceptance of initial flow recommendations.										
I.B.3.a.	Review scientific basis, dependent on development of flow recommendations by FWS.	CWCB/CDOW	Pending								
I.B.3.b.	Assess legal and physical availability of water.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the							
I.B.3.c.	Assess impacts of depletions on Colorado's Compact allocations.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the							
I.B.3.d.	CWCB notice of intent to appropriate (in Colorado).	CWCB	On hold								
I.B.4.	Legally protect identified flows.										
>* I.B.4.a.	Acquire (see Colorado River above Gunnison and Gunnison River).										
I.B.4.b.	Appropriate.										
I.B.4.b.(1)	CWCB approval to appropriate.	CWCB	On hold								
>* I.B.4.b.(2)	Colorado Attorney Generals Office file date.	CWCB	On hold								
>* I.B.4.b.(3)	Water court adjudication (litigation dependent).	CWCB	On hold								
I.B.4.c.	Deliver and legally protect flows from Aspinall (see Colorado River above Gunnison and Gunnison River).										
>* I.B.4.c.(1)	Operate Aspinall to provide test flows.	BR	Complete	Test flows provided through 1997; synthesis report and flow							
>* I.B.4.c.(2)	Continue annual coordination meetings.	BR	Ongoing	X	X	X	X	X	X		
I.B.4.c.(3)	Operate Aspinall to provide flows pursuant to biological opinion and record of decision.									Program will need to conduct monitoring to determine if flows from Aspinall are sufficient for recovery on the Colorado River from the Gunnison River to the confluence of the Green River (see IB5).	
I.B.4.c.(3)(a)	Determine if change in water right and/or contract is needed.	BR	Pending								
I.B.4.c.(3)(b)	Enter into contract if needed.	BR	Pending								
>* I.B.4.c.(3)(c)	Deliver flows.	BR	Pending								
I.B.5.	Develop study plan to evaluate flow recommendations (Aspinall Study Plan)	Program	In progress	X							
I.B.5.a.	Monitor Physical Response in the Colorado River to the Proposed Action										
I.B.5.a.(1)	Collect aerial photography during the peak flows to determine area of floodplain inundation at floodplain sites (Valdez and Nelson 2006)					X				X	
I.B.5.a.(2)	Collect aerial photography during base flows to monitor channel width and complexity and to serve as base maps for habitat mapping.					X				X	
I.B.5.a.(3)	Repeat depth-to-embededness surveys in the 18-mile reach.							X			
I.B.5.b.	Monitor Biological Responses in the Colorado River to the Proposed Action										
I.B.5.b.(1)	Initiate a fish community monitoring study in Colorado River main channel and floodplain habitats (focus on 18-mile reach)	CDOW/FWS	New start	X	X	X	X	X	X		
I.B.5.b.(2)	Assess primary and secondary productivity in cobble bars (runs and riffles)	TBD	Pending					X			
I.B.5.b.(3)	Continue ongoing fish community monitoring (CPM and HBC pop estimation; CPM Age-0 monitoring)	CDOW/UDWR	Ongoing	X	X	X	X	X	X		
I.B.6.	Integrate and synthesize information to evaluate and recommend necessary revision of the proposed action	Program	New start					X	X		
I.C.	Colorado River from Colorado-Utah State line to Green River									See also I.B.4.c.(3)	
I.C.1.	Initially identify year-round flows needed for recovery.	FWS-FR	Complete	McAda 2003.							

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	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
I.C.2.	State acceptance of initial flow recommendations.										
I.C.2.a.	Review scientific basis.	UT	Pending								
I.C.2.b.	Assess legal and physical availability of water.	UT	Pending								
I.C.3.	Legally protect identified flows.										
I.C.3.a.	Hold public meeting to establish future appropriation policy.	UT	Pending								
I.C.3.b.	Adopt and implement new policy (new appropriations subject to flow criteria).	UT	Pending								
>* I.C.3.c.	Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.	UT	Pending								
I.D.	<u>Colorado River below Green River</u>										
I.D.1.	Initially identify year-round flows needed for recovery.	FWS	Pending	X						Now that the Aspinall PBO is complete, the Service needs to determine if combination of Colorado and Green River flows below the confluence are adequate for recovery.	
I.D.2.	Assess adequacy of combined flows from Colorado and Green rivers to provide fish habitat (and meet recovery goals) in the Cataract Canyon reach of the Colorado River.	FWS	Pending		X	X				See comment under 1.d.1, above.	
I.E.	Evaluate and revise as needed flow regimes to benefit endangered fish populations. See also 1.B.5.	FWS/Program	Ongoing	X	X	X	X	X	X		
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)										
II.A.	Restore and manage flooded bottomland habitat.									O&M for floodplain sites has been characterized as TBD pending evaluations. BOR did C-6 Hyd work (to determine connections, etc.) in '08; report submitted to Program Director's office; need to cite.	
II.A.1.	29-5/8 Road Gravel Pit (became part of larger "Hot Spot Complex" in 2003.)										
II.A.1.a.	Develop and approve management plans.	FWS-FR	Complete	Burdick 1994.							
II.A.1.b.	Site design/complete environmental compliance.	BR	Complete	Levee initially breached in December 1995. To enhance post-runoff drainability, site topography was re-contoured in March 1998.							
>* II.A.1.c.	Construct.	BR	Complete								
>* II.A.1.d.	Operate and maintain.	BR	TBD, revisit as needed	Burdick 2002. Operation, maintenance and evaluation of sites incorporated into Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b) (IIA6).							
II.A.1.e.	Monitor and evaluate success; modify as needed.	FWS-FR	TBD, revisit as needed								
II.A.2.	Adobe Creek.										
II.A.2.a.	Develop and approve management plans.	FWS-FR	Complete								
II.A.2.b.	Site design/complete environmental compliance.	BR	Complete	Earthen dikes and water control structures completed in spring 1995.							
>* II.A.2.c.	Construct.	BR	Complete								
>* II.A.2.d.	Operate and maintain.	BR	TBD, revisit as needed	Hamilton et al. 1996, 1997, 2003. Operation, maintenance and evaluation of sites incorporated into Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b) (IIA6).							
II.A.2.e.	Monitor and evaluate success; modify as needed.	FWS-FR	TBD, revisit as needed								
II.A.3.	Walter Walker.										
II.A.3.a.	Develop and approve management plans.	FWS-FR	Complete	1994							
II.A.3.b.	Site design/complete environmental compliance.	BR	Complete	Initial construction was completed during FY 95.							
>* II.A.3.c.	Construct.	BR	Complete	75 cfs inlet control structure to flush selenium was completed December 1996							
>* II.A.3.d.	Operate and maintain.	BR/FWS/ CDOW	TBD, revisit as needed	Operation, maintenance and evaluation of sites incorporated into Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b) (IIA6).							CDOW actively managing WW and encouraging waterfowl hunting there.
II.A.3.e.	Monitor and evaluate success; modify as needed.	FWS-FR	TBD, revisit as needed	Hamilton et al. 1996, 1997, 2003, Scheer 1998.							
II.A.4.	Develop and implement levee removal strategy at high-priority sites.										
II.A.4.a.	Preconstruction (contaminants screening, floodability assessments, environmental compliance, design & engineering.	BR/FWS	Complete								
>* II.A.4.b.	Construction (levee breaching) [NOTE: Subject to review and approval for depression wetlands.]	BR	Complete	Burdick 2002. Levees breached at two sites (19.5 acres total). Levee removal completed and operation, maintenance and evaluation of sites incorporated into Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b) (IIA6).							
>* II.A.4.c.	Operate and maintain.	BR/FWS	Complete								Program removed sediment build-up at the Jarvis pond inlet/outlet structure in fall 2010 (same as work performed in October 2003).
II.A.4.d.	Evaluation	FWS	Complete								
II.A.5.	Acquire interest in high-priority flooded bottomland habitats.										
II.A.5.a.	Identify and evaluate sites.	FWS	Complete								

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ACTIVITY		WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
II.A.5.b.	Pre-acquisition planning and identification of acquisition options.	PD	Complete	Acquired 10 sites (394 acres total). Operation, maintenance and evaluation of sites incorporated into Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b) (IIA6).						
II.A.5.c.	Conduct appraisal/NEPA compliance.	PD	Complete							
>* II.A.5.d.	Negotiate and acquire.	PD	Complete							
II.A.5.e.	Evaluate effectiveness of land acquisition activities and provide recommendations	PD	Complete							
II.A.6.	Develop Colorado River Subbasin Floodplain Management Plan	Program	Complete							
>* II.A.6.a.	Implement, validate and refine Colorado River Subbasin Floodplain Management Plan	Program	Ongoing	X	X	X	X	X	X	- Grand Junction Pipe site (Program property) will be sampled in 2011 to determine densities of nonnative fishes. (Might be reset with rotenone prior to levee breaching, if needed.) Service and Program coordinated with landowner at Soaring Eagle Gravel Pit to determine best method for reconnection (at landowner's cost, per biological opinion) in light of potential nonnative fish invasion.
II.B.	Restore native fish passage at instream barriers.									Meetings were held in April and December 2010 with Grand Valley irrigators, Reclamation, and Recovery Program staff to discuss operations of Grand Valley fish screens and passages, identify problems and solutions, and document operational expectations and plans. These biannual meetings will continue indefinitely.
II.B.1.	Restore passage at Grand Valley Irrigation Co. Diversion Dam (Palisade)									
II.B.1.a.	Evaluate and implement viable options to restore fish passage.	BR/FWS	Complete	1997						
II.B.1.a.(1)	Obtain landowner consent/agreement.	BR	Complete	Preconstruction activities complete 1997.						
II.B.1.a.(2)	Site design/environmental compliance.	BR	Complete	Preconstruction activities complete 1997.						
>* II.B.1.a.(3)	Construct.	BR	Complete	GVIC passage construction completed in 01/98.						
>* II.B.1.a.(4)	Operate and maintain.	FWS-FR/BR	Ongoing	X	X	X	X	X	X	
II.B.1.a.(5)	Monitor and evaluate success.	FWS-FR/BR	Complete	Burdick 1999.						
II.B.1.b.	Screen GVIC diversion to prevent endangered fish entrainment, if warranted.									
II.B.1.b.(1)	Design.	BR	Complete	1999						
>* II.B.1.b.(2)	Construct.	BR	Complete	GVIC diversion canal fish screen completed in 05/02, modifications						
>* II.B.1.b.(3)	Operate and maintain.	FWS-FR/BR	Ongoing	X	X	X	X	X	X	Screen operated 139 days (68%); off 65 days (32%) in 2010.
II.B.2.	Restore fish passage at Price Stubb.									
II.B.2.a.	Evaluate and implement viable options.									
II.B.2.a.(1)	Obtain landowner consent/agreement.	BR	Complete							
II.B.2.a.(2)	Site design/environmental compliance.	BR	Complete							
>* II.B.2.a.(3)	Construct.	BR	Complete							
>* II.B.2.a.(4)	Operate and maintain.	BR	Pending	X	X	X	X	X	X	
II.B.2.a.(5)	Monitor and evaluate success.	FWS-FR/BR	Pending							! Passive PIT-tag monitoring system installed in 2010; 80 unique fish have used the passage (2 Colorado pikeminnow [all Grand Valley], 6 roundtail chub [all Black Rocks], 72 razorback sucker [stocked at Hoagland; most movement downstream]).
II.B.3.	Restore fish passage at Government Highline (aka Grand Valley Project or Roller Dam).									
II.B.3.a.	Evaluate and implement viable options.									
II.B.3.a.(1)	Site design/environmental compliance.	BR	Complete	2003						
>* II.B.3.a.(2)	Construct.	BR	Complete							
>* II.B.3.a.(3)	Operate and maintain.	BR	Ongoing	X	X	X	X	X	X	! Passage operated continuously April 16 to October 15; 18,390 fish used the passage, including 16,358 native fishes. No endangered fishes used the passage in 2010.
II.B.3.a.(4)	Monitor and evaluate success.	FWS-FR/BR	Ongoing							
II.B.3.b.	Screen Government Highline diversion to prevent endangered fish entrainment.									
II.B.3.b.(1)	Design.	BR	Complete	2002						
>* II.B.3.b.(2)	Construct.	BR	Complete	August 2005.						
>* II.B.3.b.(3)	Operate and maintain.	FWS-FR/BR	Pending	X	X	X	X	X	X	Screen operated from May 6 to November 4, bypassing the screen only a couple of days during that period.

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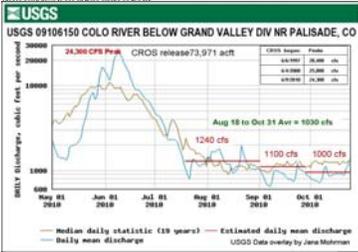
	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
II.C.	Support actions to reduce or eliminate contaminant impacts. [NOTE: Contaminants remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.]									
II.C.1.	Support actions to reduce or eliminate contaminant impacts of selenium in the Grand Valley.	FWS-ES	Ongoing	X	X	X	X	X	X	Muscle plugs will be taken from up to ten of any endangered fish collected and surrogate species as needed for contaminants evaluation.
II.C.2.	Support remediation of groundwater contamination at the Atlas Mill tailings site.	FWS-ES	Ongoing	X	X	X	X	X	X	
II.C.3.	Identify measures to minimize risk of hazardous materials spills in Black Rocks and Westwater Canyon from transport along the adjacent railway to protect humpback chub populations.	FWS-ES	Ongoing	X	X	X	X	X	X	
III.	REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)									
III.A.	Develop and implement control programs in reaches of the Colorado River occupied by endangered fishes. Each control activity will be evaluated for effectiveness and then continued as needed. See III.A.2.c.1.& 2. under General Recovery Program Support Action Plan.									
III.A.1.	Determine relationship between Aspinall test flows and nonnative fish abundance.	UDWR/ FWS-FR	Complete	McAda & Ryel 1999.						
>* III.A.2.	Reclaim ponds in critical habitat.	CDOW	Complete	Martinez 2004.						
III.A.2.a.	Evaluate and make recommendations.	CDOW	Complete							
III.A.3.	Nonnative cyprinids and centrarchids in nursery habitats.									
III.A.3.a.	Remove small nonnative cyprinids from backwaters and other low velocity habitats.	CDOW/UDWR	Complete	Trammell et al. 2002. Report completed; development and implementation of control program on hold.						
III.A.3.b.	Remove nonnative centrarchids from backwaters and other low velocity habitats.	FWS	Complete	Osmundson 2003. Report completed; development and implementation of control program on hold.						
III.A.4.	Preclude escapement from ponds in critical habitat as needed and feasible.									
III.A.4.a.	Evaluate sources of nonnative fishes and make recommendations.	CDOW/FWS	Ongoing	X						See General, III.C.
III.A.4.b.	Screen Rifle Creek below Rifle Gap Dam (non-Program funds).									
III.A.4.b.(1)	Design with appropriate peer review	CDOW/BOR /FWS	Pending	X						The screen design and its intended function will be peer-reviewed by at least two independent regional experts, including a fishery-trained fish screen specialist and an engineer specializing in fish containment screens. Information gained from this review should be considered for incorporation into the design, location or operation of the screen.
>* III.A.4.b.(2)	Construct screen	CDOW	Pending	X	X					
III.A.4.b.(3)	Finalize lake management plan, per Nonnative Fish Stocking Procedures	CDOW	Pending	X	X	X				
III.A.4.b.(4)	Conduct follow-up monitoring prior to and following stocking to determine effectiveness of screen.	CDOW	Pending	X	X	X	X	X	X	The Service recommends monitoring for five years after installation of Rifle Gap Reservoir instream fish screen prior to stocking warmwater fish species, and continued monitoring after stocking.
>* III.A.5.	Develop and implement program to identify required level of channel catfish control.	FWS	On hold	Smallmouth bass considered higher priority (2004).						
>* III.A.6.	Develop and implement program to identify required level of smallmouth bass control.	FWS	Ongoing	X	X	X	X	X	X	Adult smallmouth bass densities remained low in 2010; however capture of age-0 and age-1 smallmouth bass increased about tenfold. Largemouth bass reproduction remains a concern, but so far, these fish do not appear to be recruiting. In 2011, most effort will be redirected from upstream reaches (Rifle to Beavertail) to high smallmouth bass concentration areas in the 15- and 18-Mile reaches.
III.B.	Reduce negative impacts to endangered fishes from sportfish management activities.									
>* III.B.1.	Evaluate control options and implement measures to control nonnative fish escapement from Highline Reservoir.	CDOW/CRWCD	Complete	Fish barrier net installed in Highline Reservoir 8/99; replaced in 2005.						
III.B.1.a.	Operate and maintain Highline Reservoir net.	CDOPR	Ongoing	X	X	X	X	X	X	! X CDOP has been diligent in monitoring and cleaning the Highline net. In recent years, annual unscreened outlet releases occurred when oxygen levels would allow potential escapement/entrainment of nonnative fishes. Prior to 2011 release, Program will coordinate with Parks to revise scope of work to assure that unscreened outlet releases only occur when oxygen levels are ≤2 mg/l.
III.B.1.b.	Evaluate Highline Reservoir net.	CDOW	Complete	Martinez 2002.						

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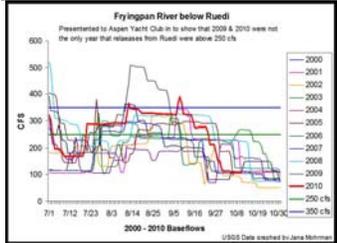
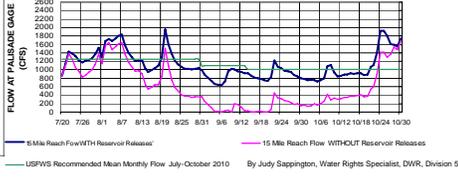
	ACTIVITY	WHO	STATUS	FY 11	FY 12	FY 13	FY 14	FY 15	OUT-	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
				10/10-9/11	10/11-9/12	10/12-9/13	10/13-9/14	10/14-9/15	YEARS		
III.B.2.	Remove bag and possession limits on warmwater nonnative sportfishes within critical habitat in Colorado.	CDOW	Complete	See Colorado fishing regulations.							
III.B.3.	Develop basinwide aquatic management plan to reduce nonnative fish impacts while providing sportfishing opportunities.	CDOW	Complete	CDOW 2003a.							
>* III.B.3.a.	Implement CDOW's Colorado River Aquatic Management Plan.	CDOW	Ongoing	X	X	X	X	X	X	! In 2011, CDOW removed harvest limits on unauthorized smallmouth bass in Highline Reservoir.	
IV.	MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES)										
IV.A.	Augment or restore populations as needed, and as guided by the Genetics Management Plan.										
IV.A.1.	Razorback sucker.										
IV.A.1.a.	Develop experimental augmentation plan and seek Program acceptance.	FWS-FR	Complete	Burdick et al. 1995.							
IV.A.1.b.	Implement experimental augmentation plan.										
> IV.A.1.b.(1)	Stock fish.	FWS-FR	Complete	Burdick 2003.							
IV.A.1.b.(2)	Monitor and evaluate results; make recommendations regarding further augmentation.	FWS-FR	Complete	Burdick 2003.							
IV.A.2.	Monitor the fish community in the upper Colorado River (above Palisade) and develop management action plan, including recommendations for Colorado pikeminnow and razorback sucker augmentation.	CDOW	Complete	Anderson 1997.							
IV.A.3.	Develop integrated stocking plan for razorbacks in the Colorado River in Colorado.	CDOW/PD	Complete	Nesler et al. 2003.							
IV.A.3.a.	Program acceptance.	CDOW/PD	Complete	Nesler et al. 2003.							
> IV.A.3.b.	Implement razorback sucker integrated stocking plan.	CDOW/PD	Ongoing	X	X	X	X	X	X		
IV.A.3.c.	Evaluate stocking success as identified in monitoring plan for stocked fish. Zelasko et al. 2009.	Program	Ongoing	X	X	X	X	X	X		
IV.A.4.	Develop integrated stocking plan for Colorado pikeminnow in the Colorado River in Colorado.	CDOW/PD	Complete	Nesler et al. 2003.							
IV.A.4.a.	Program acceptance.	CDOW/PD	Complete	Nesler et al. 2003.							
IV.A.5.	Develop integrated stocking plan for bonytail in the Colorado River from Palisade to Loma.	CDOW	Complete	Nesler et al. 2003.							
IV.A.5.a.	Program acceptance.	CDOW/PD	Complete	Nesler et al. 2003.							
> IV.A.5.b.	Implement bonytail integrated stocking plan.	FWS/CDOW	Ongoing	X	X	X	X	X	X		
IV.A.5.c.	Evaluate stocking success as identified in monitoring plan for stocked fish.	Program	Ongoing	X	X	X	X	X	X		
IV.A.6.	Develop integrated stocking plan for the four endangered fish in the Colorado River in Utah.										
IV.A.6.a.	Prepare plan.	UDWR	Complete	Nesler et al. 2003.							
IV.A.6.b.	Program acceptance.	UDWR	Complete	Nesler et al. 2003.							
> IV.A.6.c.	Implement plan.	UDWR	Ongoing	X	X	X	X	X	X		
IV.A.6.d.	Evaluate stocking success as identified in monitoring plan for stocked fish. Zelasko et al. 2009.	LFL/FWS/STATES	Ongoing	X	X	X	X	X	X		
V.	MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT)										
V.A.	Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.										
V.A.1.	Determine Colorado pikeminnow larval drift into Lake Powell.	NPS	Complete	Muth and Wick 1996, 1997.							
V.B.	Monitor populations per requirements in the 15-Mile Reach PBO.										
V.B.1.	Determine initial baselines and indices for Colorado pikeminnow and humpback chub.	PD	Complete	Appendix to biological opinion (USFWS 1999a) and recovery goals (USFWS 2002a, 2002c).							
V.B.1.a.	Evaluate population response, per 15-Mile Reach PBO (every 5 years beginning in FY 05).	FWS	Ongoing	X	X	X	X	X	X		
V.B.2.	Determine initial baselines and indices for razorback sucker and bonytail.	PD	Complete	See recovery goals, USFWS 2002b, 2002d.							
V.B.2.a.	Evaluate population response, per 15-Mile Reach PBO (every 5 years beginning in FY 05).	FWS	Ongoing	X	X	X	X	X	X		
V.B.3.	Revise population indices to conform to recovery goals.	FWS	Complete	2003 PBO evaluation (in concert with 2003 RIPRAP assessment).							

COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
V.B.4.	Monitor incidental take.										
V.B.4.a.	Develop plan to monitor incidental take of endangered fishes in diversion structures	FWS	Complete	"Plan" completed in that fish are being retrieved from canals until the canals							
V.B.4.b.	Implement plan to monitor incidental take of endangered fish in diversion structures.	FWS	Ongoing	X	X	X	X	X	X	Fish salvage conducted in canals when screens not operated.	
V.C.	Estimate humpback chub populations. (Sampling occurs in September and October, overlapping fiscal years.)										
V.C.1.	Black Rocks. See McAda 2002.	FWS	Ongoing	X	X				X	X Number of adults continues to decline (Francis and McAda, in prep.).	
V.C.2.	Westwater. See Hudson and Jackson 2003.	UDWR	Ongoing	X	X				X		
V.C.3.	Cataract Canyon	UDWR/Valdez	Ongoing	X	X	X	X	X	X	Cataract Canyon sampling is now annual CPUE; low numbers of HBC collected (3) in 2010.	
V.D.	Estimate pikeminnow populations in the upper Colorado River (including Gunnison River). Three years sampling (e.g., FY 03, 04, 05) followed by two years no sampling; data analysis and report write-up in first year of no sampling (e.g., FY 06). See Osmundson and White 2009.	FWS	Ongoing			X	X	X	X	Draft report for 2008-2010 estimates due in 2011 (draft to peer review August 30).	



**IMPACT OF LATE IRRIGATION SEASON RESERVOIR RELEASES
IN THE 15 MILE REACH
(As Measured at the Colorado River at Palisade Gage)
2010 LATE SUMMER/FALL**



Coordinated Reservoir Operations						Peak Flows	
	1997	1998	1999	2006	2008	2009	2010
Green Mtn	3568	12482	11010	6788	2101	14113	34666
Ruedi	693	5106	3602	6297	4848	5858	10050
Williams Fork	946	1672	1543	6625		5044	19982
Granby			8515				
Wilndy Gap						2061	
Willow Creek			6631			2638	
Wolford	10635	4431	8555	9007		13069	9273
Total Ac-Ft	15841	23691	31301	28717	6949	42783	73971
							Total 223253
							Avr 31893

Historic Users Pools		Base Flows											
Source	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Ruedi	18722	18376	17158	19210	9877	18901	14782	15876	18204	13203	18892	19261	19263
Wolford Mtn	10364	4445	9965	7719	277	257		900	9580	6155	9389	7873	7572
Williams Fork		1642	3472	4832	3381	3381	2410	3433	4871	2155	9340	4870	4872
Willow Creek		584											
Windy Gap											764		893
Granby		24223										2574	4602
Green Mtn	28562	32008	42468	31118	0	42774	107	28080	22822	29470	55290	50661	52032
Palisade Bypass					2235	6609	7043	10076	0	8944	12000	11905	13760
Sum acft	57648	81278	73063	62879	15770	71922	24342	58365	55477	59927	105674	97143	102994
			Avr = 66653 acft			Total = 866483 acft							

By Jana Mohrman (FWS) and Ron Thomasson (BOR)

COLORADO RIVER ACTION PLAN: GUNNISON RIVER

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)									
I.A.	Identify fish habitat and flow needs.									
I.A.1.	Initially identify year-round flows needed for recovery (Flow recommendations will be provided upon completion of Aspinall Unit studies.)									
I.A.1.a.	Complete draft technical synthesis report.	FWS	Complete	McAda 2000.						
I.A.1.b.	Complete draft biological assessment.	BR	Complete							
I.A.1.c.	Complete final technical synthesis report.	FWS	Complete	McAda 2003.						
I.A.1.d.	Complete final biological assessment.	BR	Complete							
I.A.1.e.	Complete draft NEPA document .	BR	Complete							
I.A.1.f.	Complete final NEPA document.	BR	Pending							X Final EIS delayed; anticipated in 2011.
I.A.1.g.	Complete ESA Section 7 consultation resulting in a programmatic biological opinion (PBO) for the Gunnison Basin.	FWS/BR/WAPA	Complete							
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, dependent on development of flow recommendations by FWS.	CWCB/CDOW	Complete	Complete with acceptance of McAda 2003.						
I.B.2.	Assess legal and physical availability of water.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the work was used as the basis for developing depletion schedules for the Colorado River.						
I.B.3.	Assess impacts of depletions on Colorado's Compact allocations.	CWCB	Complete	Colorado completed work on a water availability study in early 1995 & the work was used as the basis for developing depletion schedules for the Colorado River.						
I.B.4.	CWCB notice of intent to appropriate (in Colorado).	CWCB	On hold							
I.C.	Legally protect identified flows.									
I.C.1.	Acquire (flow recommendations will be provided upon completion of Aspinall Unit studies.)									
I.C.1.a.	Assess, acquire and convert water rights to instream flows.	CWCB	On hold							
I.C.2.	Appropriate (flow recommendations will be provided upon completion of Aspinall Unit studies.)									
I.C.2.a.	CWCB approval to appropriate.	CWCB	On hold							
>* I.C.2.b.	Colorado Attorney General's Office file date.	CWCB	On hold							
>* I.C.2.c.	Water court adjudication (litigation dependent).	CWCB	On hold							
I.C.3.	Deliver.									
>* I.C.3.a.	Aspinall Unit supplemental releases to maintain 2,000 cfs minimum flow at Colorado-Utah state line 9 out of 10 years. Provide annual report. (Through 2001 only.)	BR	Complete							
I.C.3.b.	Flows from Aspinall Unit for research studies.									
>* I.C.3.b.(1)	Deliver flows.	BR	Complete							
>* I.C.3.b.(2)	Protect research flows.	FWS/BR/ CWCB	Complete	An interim contact is in place between Reclamation, Service & CWCB. Long term legal protection of Gunnison River flows will occur after completion of Aspinall biological opinion (BR 04/95-FY96).						
>* I.C.3.c.	Continue annual coordination meetings.	BR	Ongoing	X	X	X	X	X	X	
I.C.3.d.	Flows from Paonia Reservoir in accordance with FWS Horsethief Biological Opinion.									
>* I.C.3.d.(1)	Deliver flows.	BR	Ongoing	X	X	X	X	X	X	
I.C.3.e.	Flows from Aspinall Unit pursuant to Aspinall Biological Opinion and record of decision..									
I.C.3.e.(1)	Determine if change in water right and/or contract is needed.	BR	Pending							
I.C.3.e.(2)	Enter into contract if needed.	BR	Pending							
>* I.C.3.e.(3)	Deliver flows.	BR	Pending							
I.C.3.e.(3)(a)	Study Gunnison River return flows to determine consumptive use to be charged against flow deliveries.	USGS	Complete	Kuhn and Williams 2004.						

COLORADO RIVER ACTION PLAN: GUNNISON RIVER

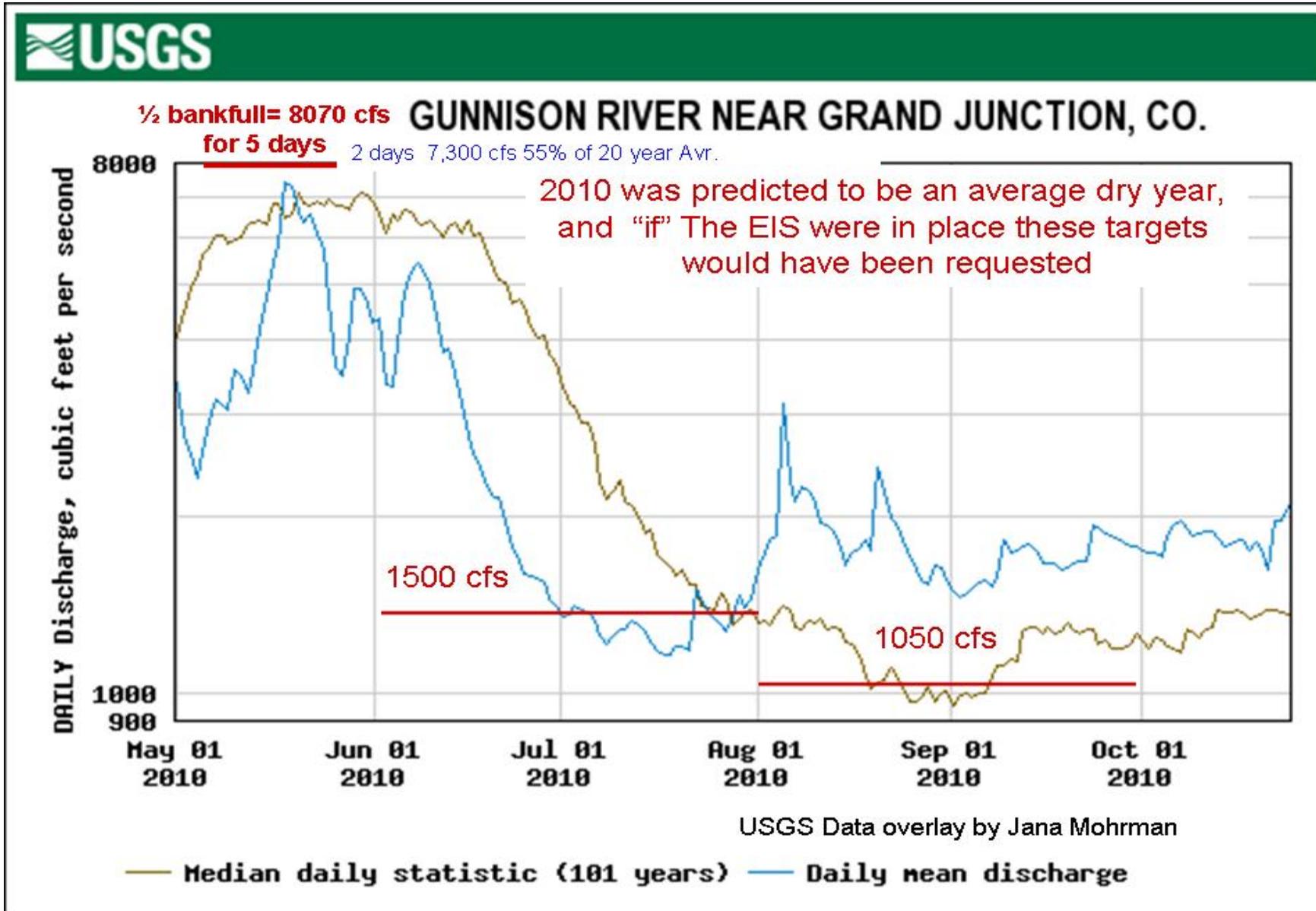
	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)	
I.D.	Evaluate and revise as needed flow regimes to benefit endangered fish populations. (Data series summarizing 2005-2008 daily sediment sampling on Gunnison, Green and Duchesne rivers completed [Williams et al. 2009]; analytical report in review.)	FWS/Program	Ongoing	X	X	X	X	X	X	Program Office, WAC and BC reviewed first draft of USGS sediment report on the Gunnison River in Colorado and the Green and Duchesne Rivers in Utah (FR-Sed Mon); second and final review will be done during Feb.2011. Also, the author's MS thesis (in progress) will provide further information on sediment hydraulics on the spawning bar in the Green River.	
I.D.1.	Develop study plan to evaluate flow recommendations / evaluate Selenium Management Program.	FWS/BOR/W APA	In progress	12/2010						! Draft study plan sent to Biology Committee (with copy to Management Committee) 11/29/10; anticipate completion by April 2011.	
I.D.1.a.	Monitor Physical Response in the Gunnison River to the Proposed Action.										
I.D.1.a.(1)	Reinstate sediment monitoring in the Gunnison River as directed by project 85f.	TBD	New start		X	X	X				
I.D.1.a.(2)	Collect aerial photography during the peak flows to determine area of floodplain inundation at Escalante SWA and other sites.	TBD	Pending			X					
I.D.1.a.(3)	Collect aerial photography during base flows to monitor channel width and complexity and to serve as base maps for habitat mapping.	TBD	Pending			X					
I.D.1.a.(4)	Repeat depth-to-embeddedness (DTE) surveys in the Escalante area.	TBD	Pending					X			
I.D.1.b.	Monitor Biological Responses in the Gunnison River to the Proposed Action.										
I.D.1.b.(1)	Initiate a fish community monitoring study in Gunnison River main channel and floodplain habitats.	CDOF/FWS	New start	X	X	X	X	X	X		
I.D.1.b.(2)	Assess primary and secondary productivity in cobble bars (runs and riffles).	TBD	Pending					X			
I.D.1.c.	Support Reclamation's Selenium Management Program.										
I.D.1.c.(1)	Collect tissues from endangered fish (or surrogate species) as directed by FWS (coordinated with fish community monitoring, I.D.1.b.(1)).	CDOF/FWS	New start	X	X	X	X	X	X	Muscle plugs are being taken from any endangered fish collected and surrogate species as needed for contaminants evaluation (evaluation funded outside of Program).	
I.D.1.c.(2)	Investigate selenium toxicity in razorback sucker.	Program	New start		X	X	X	X	X		
I.D.2.	Integrate and synthesize information to evaluate and recommend necessary revision of the proposed action	Program	New start					X	X		
I.E.	Initiate investigations of the feasibility of modifying releases from Aspinall Unit dams to increase water temperatures that would allow for upstream expansion of Colorado pikeminnow in the Gunnison River.	BR/Contract	Complete	Boyer and Cutler 2004.							
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)										
II.A.	Restore and manage flooded bottomland habitat.										
II.A.1.	Develop management plan for Escalante State Wildlife Area.		Complete 5/94	Burdick 1994.							
II.A.2.	Develop and implement levee removal strategy at high-priority sites.										
II.A.2.a.	Preconstruction (contaminants screening, floodability assessments, environmental compliance, design & engineering).	BR	Complete	Construction completed at Escalante State Wildlife Area (200 acres) in January 2001; Butch Craig's (Unaweep Charolais Ranch) (98.7) was completed October 2003. Levee removal completed and operation, maintenance and evaluation of sites incorporated into Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b) (IIA4).							
>* II.A.2.b.	Construction (levee removal)	BR	Complete								
II.A.2.c.	Operate and maintain.	BR/FWS	Complete								
II.A.2.d.	Evaluation.	FWS	Complete								Failing Butch Craig floodplain repaired in FY 10.
II.A.3.	Acquire interest in high-priority flooded bottomland habitats.										
II.A.3.a.	Identify and evaluate sites.	FWS	Complete								
II.A.3.b.	Pre-acquisition planning and identification of acquisition options.	PD	Complete	Three sites acquired (198 acres total). Floodplain acquisition completed and operation, maintenance and evaluation of sites incorporated into Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b) (IIA4).							
II.A.3.c.	Conduct appraisal/NEPA compliance.	PD	Complete								
>* II.A.3.d.	Negotiate & acquire.	PD	Complete								
II.A.3.e.	Evaluate effectiveness of land acquisition activities and provide recommendations.	PD	Complete								
>* II.A.4.	Develop and implement Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b).	Program	Ongoing	X	X	X	X	X	X		
II.B.	Restore native fish passage at instream barriers.										
II.B.1.	Restore passage at Redlands.										
II.B.1.a.	Assess and make recommendations for fish passage.	FWS	Complete	Burdick and Kaeding 1990.							
II.B.1.b.	Implement viable options to restore fish passage.										
II.B.1.b.(1)	Design passage, conduct NEPA compliance.	BR	Complete	1996 RR; Passage under construction as of 11/20/95, to be completed by 04/96, 96status.ast							
>* II.B.1.b.(2)	Construct fish ladder.	BR	Complete	Construction completed in June 1996 (Burdick 2001).							

COLORADO RIVER ACTION PLAN: GUNNISON RIVER

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
>*	II.B.1.c. Operate and maintain fish ladder.	FWS-FR/BR	Ongoing	X	X	X	X	X	X	! Ladder operated April 16 through October 15. 6,708 fish used the ladder in 2010; of those 5,805 were native fishes, including 4 pikeminnow and one stocked razorback sucker and 1 humpback chub from Westwater. One hundred and eight pikeminnow, 27 razorback sucker, one bonytail, and now 1 humpback chub have used the ladder since summer 1996.
	II.B.1.d. Monitor and evaluate success.	FWS-FR/BR	Complete	Burdick 2001.						
	II.B.1.e. Identify minimum flows below Redlands Diversion Dam.	FWS-FR	Complete	Burdick 1997.						
>*	II.B.1.f. Deliver flows below Redlands.	BR	Ongoing	X	X	X	X	X	X	
	II.B.1.g. Screen Redlands diversion structure to prevent endangered fish entrapment.									
	II.B.1.g.(1) Design.	BR	Complete	2003						
>*	II.B.1.g.(2) Construct.	BR	Complete	August 2005.						
>*	II.B.1.h. Operate and maintain fish screen.	Redlands	Ongoing	X	X	X	X	X	X	Operated fish screen for 197 days (89%); was off for 25 days (11%).
	II.B.2. Restore passage at Hartland.									
	II.B.2.a. Assess and make recommendations for fish passage. (Passage at Hartland not identified as necessary for recovery in species' recovery goals).	FWS-FR	Complete	Burdick and Pfeifer 1996.						
	II.B.2.b. Evaluate viable options to restore fish passage.	BR	Complete	Burdick and Pfeifer 1996. Tetra Tech 2000 (evaluated 3 design options for passage and 3 options for screens).						

COLORADO RIVER ACTION PLAN: GUNNISON RIVER

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
II.B.2.c.	Support local interests in efforts to pursue removal of the Hartland Diversion dam. [NOTE: These efforts will be conducted independently of and funded outside of the Recovery Program]	BR/FWS/PD	Ongoing							FWS working with Painted Sky Resource Conservation and Development Council on Hartland Diversion Dam fish passage (Recovery Act funding with CWCB, FWS, and other cost-share); construction delayed due to higher-than-expected bids.
II.B.2.d.	Screen Hartland diversion to prevent endangered fish entrainment, if warranted.									
II.B.2.d.(1)	Assess need.	BR/FWS/PD	Complete							
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.	Reclaim ponds in critical habitat	CDOW	Complete	Martinez 2004.						
III.A.1.a.	Evaluate and make recommendations.	CDOW	Complete							
III.A.2.	Develop basinwide aquatic management plan to reduce nonnative fish impacts while providing sportfishing opportunities.	CDOW	Complete	CDOW 2003b.						
>* III.A.2.a.	Implement CDOW's Gunnison River Aquatic Management Plan.	CDOW	Ongoing	X	X	X	X	X	X	! In 2011, CDOW removed harvest limits on illegally-introduced northern pike in Crawford Reservoir.
III.A.3.	Preclude new nonnative species introductions, translocations or invasions to preserve native species dominance within critical habitat.	Program	Ongoing	X	X	X	X	X	X	! CDOW is installing a fish screen on Juniata Reservoir which drains into a tributary to the Gunnison. The topic of precluding new species introductions also will be addressed in the draft Nonnative Fish Strategy.
IV.	MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES)									
IV.A.	Augment or restore populations as needed and as guided by the Genetics Management Plan.									
IV.A.1.	Razorback sucker.									
IV.A.1.a.	Develop experimental augmentation plan and seek Program acceptance.	FWS-FR	Complete	Burdick et al 1995.						
IV.A.1.b.	Implement experimental augmentation plan. (Goal: 10 adults/river mile.)									
> IV.A.1.b.(1)	Stock fish.	FWS-FR	Complete	Burdick 2003.						
IV.A.1.b.(2)	Monitor and evaluate results; make recommendations regarding further augmentation.	FWS-FR	Complete	Burdick 2003.						
IV.A.2.	Develop integrated stocking plan for Colorado pikeminnow in the Gunnison River.									
IV.A.2.a.	Program acceptance.		Complete	Nesler et al 2003.						
> IV.A.2.b.	Implement Colorado pikeminnow integrated stocking plan.	CDOW/FWS	On hold							
IV.A.2.c.	Evaluate stocking success as identified in monitoring plan for stocked fish.	FWS/CDOW	On hold							
IV.A.3.	Develop integrated stocking plan for razorback sucker in the Gunnison River.									
IV.A.3.a.	Program acceptance.		Complete	Nesler et al 2003.						
> IV.A.3.b.	Implement razorback sucker integrated stocking plan.	CDOW/FWS	Ongoing	X	X	X	X	X	X	
IV.A.3.c.	Evaluate stocking success as identified in monitoring plan for stocked fish.	LFL/FWS/STAT ES/PD	Ongoing	X	X	X	X	X	X	
V.	MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT)									
V.A.	Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.									
V.A.1.	Conduct Colorado pikeminnow and razorback sucker inventory in Gunnison River above Redlands.	FWS-FR	Complete	Burdick 1995.						
V.A.2.	Identify additional spawning sites of endangered fishes on the Gunnison River.	FWS-FR	Ongoing							



COLORADO RIVER ACTION PLAN: DOLORES RIVER

	ACTIVITY	WHO	STATUS	FY 11 10/10-9/11	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2010 - January 31, 2011)
III.	REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)									
III.A.	Reduce negative interactions between nonnative and endangered fishes.									
III.A.1.	Assess need and options to control nonnative fish escapement from McPhee Reservoir.	BR	Complete	McPhee Reservoir management plan was prepared by CDOW & accepted by the Service on 05/25/95.						
III.B.	Reduce negative impacts to endangered fishes from sportfish management activities.									
III.B.1.	Identify potential conflicts between present fish management practices in McPhee Reservoir and endangered fishes and formulate an alternative management plan.	CDOW	Complete	McPhee Reservoir management plan was prepared by CDOW & accepted by the Service on 05/25/95.						! In 2011, CDOW removed harvest limits on illegally-introduced walleye in McPhee.
V.	MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT)									
V.A.	Survey native and nonnative fish in Dolores River (UDWR funding outside of Program).	UDWR	Complete							

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APPENDIX: CRITICAL HABITAT ANALYSIS
September 8, 1994

BACKGROUND

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

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

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

it addressed these constituent elements and to identify existing and new actions that will contribute to the RIPRAP serving as a reasonable and prudent alternative to the likely destruction or adverse modification of critical habitat. Then, in coordination with the Management Committee, the Service recommended additions needed to address all of the constituent elements, to better define the expected result of the recovery action, and to increase the certainty that the constituent elements of critical habitat would be protected.

MODIFICATIONS

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

paper first addressed what restoration and protection measures are needed and then how they might be accomplished. After completion of the issue paper, viable options were identified and a restoration strategy developed for selected geographic areas (e.g. Grand Valley and Ashley Valley).

Floodplain restoration activities may be implemented by the Recovery Program or by Recovery Program participants individually. Responsibilities of other agencies were identified in the issue paper, and actions were implemented consistent with authorities outside the Recovery Program.

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