



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 21, 2012

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 is a measure of accomplishment the U.S. Fish and Wildlife Service uses to determine if 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). Once critical habitat was designated, the RIPRAP was reviewed by the Service and modified in coordination with the Management Committee. 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.

Five-year status reviews were completed for Colorado pikeminnow and humpback chub in 2011 (USFWS 2011 a & b). Both species remain “endangered,” but progress was indicated on whether a recovery factor criterion was “met”, “partially met”, or “not met”. The razorback sucker and bonytail 5-year status reviews are nearly complete.

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 2012–FY 2023 is approximately \$116.8 million¹. 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 \$85.5 million from FY 2012–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 or other funds²); the

¹ Expenditures to date may be found in the pie charts of the most recent [Program Highlights briefing document](#).

² Non-Federal Recovery Program partners are currently seeking to extend the authorization to utilize hydropower revenues for annual base funding to FY2019 because the authorization contained in P.L. 106-392 for base funding other than for operation and maintenance of capital projects and monitoring expired September 30, 2011.

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 \$31.3 million will be spent between FY 2012 and FY 2023 for remaining capital projects (\$27 million for projects and \$4.3M 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 caret 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 gauge 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). In 2012, USGS will publish results of a sediment transport study on three locations in the upper Colorado River basin (Colorado River at Cameo, Gunnison River at Grand Junction, and Green River at Jensen). These results will help the Recovery Program understand how flow recommendations may be benefitting recovery of the endangered fishes. A team of experts is being assembled to review the findings and determine whether the current flow recommendations need to be adjusted or additional data are needed.

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), were reviewed in 2011, and will be revised in 2012. 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.

In 2011, the Service and The Nature Conservancy formatted the Recovery Program's flow recommendations and three National Wildlife Refuge water rights for inclusion as non-consumptive water needs in the [Colorado River Basin Water Supply and Demand Study](#) conducted by the Bureau of Reclamation. The study encompasses all seven Colorado River Basin States. It looks at current and future imbalances in water supply and demand in the basin and adjacent areas through 2060 including projected effects associated with climate change and attempts to develop and analyze options and

strategies to resolve imbalances. The final report will be available in the summer of 2012; updates of this effort are planned every 5 years.

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 Colorado Parks and Wildlife (CPW). 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 and is planning a similar approach on the White River. 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 or other protective mechanisms at least every 5 years and document their findings.

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). To date, Utah has completed their water rights model based on historical data and additional model runs based on operational data are pending from Reclamation.

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 continued in 2011-2012.

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.

An ad hoc group reviewed the population and known genetics information from all the humpback populations and concluded that the Recovery Program should: 1) use a decision tree to guide choices in creating a refuge population and potentially stocking fish into the wild; and 2) genetically test, and if appropriate, use Westwater Canyon and Black Rocks humpback chub to initially provide a refuge for Upper Colorado River Basin genetics, because they genetically represent most populations in the upper basin. 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 7 years and is being revised based on recent estimates of survival of the stocked fish. . A revised stocking plan may recommend stocking bonytail in floodplain habitats instead of canyon-bound reaches, since new information suggests floodplains may be more suitable habitat.

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) 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). Following the 2006 Record of Decision, Reclamation provided peak flows that met or exceeded the Muth et al (2000) recommendations. Reclamation achieved these peak flow magnitudes and durations by timing Flaming Gorge releases to match peak Yampa River flow, thus minimizing releases needed to achieve the targets. A 2011 synthesis by Bestgen et al. showed that after 1993, releases occurred prior to larval razorback sucker drift and suggested that this approach may not be providing for successful razorback sucker recruitment. In response, the Recovery Program proposed that Reclamation use the occurrence of razorback sucker larvae in channel margin habitats (an indication that larval drift is occurring in the river) as the “trigger” to determine when peak releases should occur from Flaming Gorge Dam. A Larval Trigger Study Plan (Larval Trigger Study Plan ad hoc Committee. In prep.), consistent with the Muth et al. (2000) flow recommendations, will be implemented for an experimental period of about six years beginning in 2012.

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, culminating in legal streamflow protection in 2015 (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). A third 3-year sampling period was started in 2011. 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 2012).

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 releases for the endangered fish began 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 or other protective mechanisms at least every 5 years and document their findings. The Program determined in November 2011 that additional permanent protection in the form of instream flow filings was not deemed necessary at that time. As part of their pending Yampa River depletion accounting report, CWCB will make a recommendation that addresses projected future depletions regarding whether or not additional instream flow filings or other flow protection mechanisms should be considered.

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 continued in 2011–2012.

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 2012). 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. The

2005 update formalized high flow recommendations (recommending maintaining an average of 7,000 cfs-days above 4,000 cfs) based on an evaluation of the high flows that occurred during the 1977-2002 period of record and the response of sediment and other channel characteristics to these flows. 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; recently this work has been conducted primarily outside the Recovery Program and done sporadically depending on Ute Tribe and USFWS Utah Fish and Wildlife Coordination Office available time and funds. 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 at this time. In 2011, isotopic analyses indicated that Starvation Reservoir appears to be a chronic source of walleye entering the Green River; therefore, screening or other preventative measures should be evaluated.

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. In 2011, researchers documented razorback suckers spawning in the White River for the first time. 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.

In 2011, researchers reported increasing abundance of smallmouth bass (and evidence of reproduction); Program will begin removing smallmouth bass from the White River in 2012.

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 2011). 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 2012, 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 or other protective mechanisms at least every 5 years and document their findings.

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 released a draft EIS in February 2009; the Preliminary Final EIS was sent to the cooperators in November 2010; and a draft Record of Decision was released in February 2012. 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. A study plan to evaluate effects of Aspinall Unit operations to benefit habitat and recovery of endangered fishes in the Gunnison and Colorado rivers was completed in 2011 (Aspinall Unit Study Plan *ad hoc* Committee 2011).

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 efforts independent of the Recovery Program to try to prevent/limit escapement of nonnative sport fish (e.g., smallmouth bass, yellow perch, and kokanee salmon) from McPhee Reservoir. However, smallmouth bass have become established in the Dolores River and may become an additional source for this invasive species in the Colorado River. The reservoir also may be a source of walleye escapement. 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. 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 (See also CPW)
CDOW	Colorado Division of Wildlife (See also CPW)
CPW	Colorado Parks and Wildlife (CDOPR & CDOW merged in 2011)
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/PDO	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 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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	! In 2011, aerial photos were taken of critical habitat during peak flows; raw footage resides at: http://upperbasinphotos.com/index.html (processing pending in 2012). Also, in October of 2011 the Recovery Program approved the USGS sediment report on the Gunnison River in Colorado and the Green and Duchesne Rivers in Utah (FR-Sed Mon); it is in the USGS print process and the title is still draft. The next step is to interpret this physical science as it applies to / validates the endangered fish flow recommendations.
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 2011 contaminants-related activities in the upper basin available on web under Program annual reports (also addresses 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 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
	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	As per the Gunnison River PBO, Reclamation produces a Selenium Management Plan and secures funding for related activities via the Salinity Program.
	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	USFWS Ecological Services addresses this through Section 7 consultation, although not all pipeline approvals have a federal nexus that results in consultation. USFWS should consider how best to address this concern.
>*	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. USFWS should investigate use of PIMMA to address existing pipelines that may need shutoff valves.
	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	Spill contingency response: FWS participates in State & Federal hazmat spills emergency response programs and reviews response actions, contingency plans, and spill drills. Sub Area Contingency Plans under the National Contingency Plan need updating (FWS informed EPA of need to update plans associated with CO River and tributaries. In FY11, FWS assisted in updating the Green and Colorado River Sub Area Spill Contingency Plans. Utah holds annual multi-agency workshops, to plan for future emergencies, including spills and responses, review lessons learned, and promote better coordination among agencies during response activities. In FY11, FWS participated on spill response panel and continued working with Utah to improve incident notifications. Spill notifications are now more timely and include information on whether spills have reached surface waters and whether wildlife have been observed in the immediate area. Special notices have been provided to FWS during events that may particularly affect DOI trust resources. See also II.B.
	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).						
	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	Final draft floodplain issues report given to Mgmt. Comm. 2/00. 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).						
	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)									

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	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
III.A.	Reduce negative interactions between nonnative and endangered fishes.									Basin-wide nonnative fish strategy (BW Strategy) draft submitted to BC and MC August 29 recommends focusing on prevention, eradication and swift control of problematic species. NNFSC met November 28, 2011 in GJ, CO to review and discuss edits to BW Strategy. Agreed to have separate section for PR/I&E drafted by I&E Committee, to incorporate results/recommendation from final reports for Projects 161 (SMB Synthesis) and C-18/19 (otolith microchemistry), and pre- and post-reclamation (rotenone) guidance for PR, O&M, and replacement sport fisheries for UCRB reservoirs containing invasive piscivores (i.e. northern pike, smallmouth bass, walleye).
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	CRFP-Grand Junction working with geneticists to determine incidence of sucker hybridization in larval samples collected from Colorado and Gunnison rivers. Program still 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							
>*	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 2011 Nonnative Fish Workshop, Pl's, managers, and others discussed preliminary results from the 2011 field studies and suggested revisions to the 2012 Work Plan. 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). Additional removal will focus on northern pike in Upper Colorado River near Rifle Creek confluence and on SMB below Kenney Reservoir in Colorado. That said, we are learning that the effectiveness of mechanical removal is somewhat limited, underscoring the need to take an integrated approach (i.e., Basinwide Nonnative Fish Management Strategy) to achieve our management objectives.
	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 Pl's and identified as a task in individual scopes of work). (YS G-3)	Pl's	Ongoing	X					X	Focus has shifted to species-level (programmatic) synthesis for nonnative fish management actions. The Nonnative Fish Subcommittee recommended that syntheses be completed for: 1) Yampa River native fish response; 2) Green River native fish response; and 3) Lodore/Whirlpool Canyon; however additional funding needed to complete these synthesis reports may not be available. Ongoing analysis of nonnative fish early life history (otolith examination) as affected by environmental conditions needs to be finalized.

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	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
III.A.2.c.(2)	Programmatic synthesis: assimilate project-level data into a basinwide and population scale analyses of effectiveness of nonnative fish management. (YS G-3)	PD	Ongoing	X						CSU's evaluation of the Program's smallmouth bass control is near completion and the post-doc provided preliminary presentations at the Nonnative Fish Workshop and Researcher meeting. Preliminary results through 2010 indicate: 1) that this analysis will be helpful in re-directing or intensifying removal efforts; and 2) smallmouth bass populations are affected by environmental factors (flows and temperature) and removal efforts. Similar synthesis of northern pike data began in 2011.
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) is providing models; workshop or similar effort will be needed to train Program personnel in model use and application.
>*	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.
>*	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 is incorporating genetic bicontrol research recommendations in the draft Nonnative Fish Strategy. CSU study analyzing otolith/crayfish microchemistry to determine sources of nonnative fish found in the rivers is nearing completion and application of technique is ongoing (see also III C. below).
III.B.	Reduce negative impacts to endangered fishes from sportfish management activities.									Program is 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 the private sector to help prevent inadvertent introductions of problematic species.
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						
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. This recommendation will be included in the Basin-wide Strategy.
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.						

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
	III.B.4. Incorporate final Procedures into State aquaculture permitting process.									Meetings between CPW and nonnative fish coordinator with Colorado's Fish Health Board have described recommended modifications to existing State regulations. Colorado and Fish Health Board have yet to agree on implementing these recommendations.
>*	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 & Nibbelink 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							CPW pursuing 2012 regulation revisions to implement 2009 Stocking Procedures for private sector with Colorado's Fish Health Board. 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.									NNF coordinator hosted meeting of CPW, UDWR, WY G&F, and USFWS fishery and law enforcement personnel on October 17, 2011 in GJ, CO to review and discuss extent and implications of illegal fish stocking in the UCRB and to formulate proactive/consistent/strict/severe practices, policies, regulations and penalties to combat illegal fish movements within and among UCRB states to protect sport fisheries, native fishes, and prospects for endangered fish recovery.
	III.B.7.a. Develop plan	STATES	Ongoing	X						In 2011, Recovery Program and FWS (included in 2011 sufficient progress memo) recommended upper basin states squarely addresses the issue of illicit stocking by adopting strict and severe penalties for illegal introduction of nonnative aquatic species and facilitating education, enforcement and incentives to promote compliance and prosecution as needed. Review of existing best management practices provides examples for combatting this problem; Recovery Program encourages consistent adoption and application of penalties and enforcement strategies. The PDO urges personnel from the upper basin states, Recovery Program and FWS to continue to meet on a regular basis to expedite progress in implementing strategies/policies to address the expanding problem of illegal fish introductions.
>*	III.B.7.b. Implement plan	STATES	Pending	X	X	X	X	X	X	X Review of extent of illegal fish introductions demonstrates existing, expanding problem and need for urgent response by States to curb problem in UCRB.

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	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
III.B.8.	Evaluate designation of native fish conservation areas	STATES	Ongoing	X	X	X	X	X	X	UT (White River, UDWR and BLM lead) and WY (Muddy Creek) are promoting this idea through the Desert Fishes Habitat Partnership with the BLM as the lead. Articles in Fisheries magazine in 2011 describe the concept. Such a designation and recognition by a multi-agency and multi-NGO coalition would demonstrate mutual commitment to restoring/conserving the native aquatic community required to facilitate and perpetuate recovery of endangered fishes. Federal designation as critical habitat for Colorado pikeminnow does not sufficiently portray the need to protect the native aquatic community, and tends to focus the biological conservation needs of the Yampa and other river segments on a single species. Not all occupied habitat is designated as critical habitat.	
III.C.	Evaluate sources of nonnative fishes into critical habitat using isotope technology.	CPW CSU	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 investigated signatures from non-migratory sentinel organism (crayfish); results inconclusive. Technique to be applied in 2012 to assess origins of northern pike in upper Colorado River in CO and walley in middle Green River in UT.	
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	3/31/2013	X	X	X	X	Ad hoc group drafted recommendations for humpback chub broodstock development.	
IV.A.3.	Conduct genetic diversity studies (includes Gila 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/CPW	Ongoing	X	X	X	X	X	X		
IV.A.4.c.	Humpback chub.									Ad hoc group recommends collecting fin clips from adult humpback chub to determine level of genetic introgression (relates to broodstock development).	
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	200 age-0 <i>Gila</i> will be brought into captivity from Black Rocks/Westwater in 2012 (relates to broodstock development once fish are determined to be humpback chub).	
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	24 humpback chub from Yampa Canyon are being held at Ouray NFH - Randlett. See IV.A.4.c.	

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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. Seventeen remain at Ouray NFH-Randlett. See IV.A.4.c.
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.									
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, CPW	Annual	X	X	X	X	X	X	Good production from all 4 facilities. Integrated stocking plan in revision with implementation planned for 2013.
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.	CPW	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 Czaplá 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						Construction underway; completion anticipated summer 2012.
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 have been discontinued (new Horsethief ponds to be 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 finalized in 2011.
IV.E.3	Modify stocking plans to ensure successful stocking.	Program	Ongoing	X	X	X	X	X	X	X Integrated stocking plan behind schedule but in revision with implementation planned for 2013. Health Condition Profiling (HCP) began 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	

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V.A.1.a.	Develop basinwide razorback monitoring program (implementation to be reflected in sub-basin worksheets)	LFL		X						Razorback monitoring plan behind schedule, but submitted March 19, 2012. In the interim, main channel electrofishing (Colorado pikeminnow population estimates and nonnative fish management projects) are capturing adult razorback sucker; ongoing Projs 22f and 163 and new Green River floodplain monitoring projects contribute to monitoring early life stages. Consider monitoring Colorado River arm of Lake Powell in the future.
V.A.2.	Evaluate population estimates.	PD	Ongoing	X	X	X	X	X	X	Program needs to compile all humpback chub recapture histories back to 1990 to determine if annual estimates of survival, growth or growth-to-age relationships can be developed (Black Rocks/Westwater, Desolation); Gary White and LFL are working on this (as well as addressing trap shyness, abundance, and transition probabilities).
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.									
V.B.1.	Identify significant deficiencies in life history information and needed research. Research Framework completed: Valdez, R.A., A. Widmer, K. Bestgen. 2011. Research Framework for the Upper Colorado River Basin. Final Report of SWCA Environmental Consultants and Larval Fish Laboratory, Colorado State University Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.	PD	Ongoing	X	X	X	X	X	X	Research Framework study complete. One recommendation of this study was to implement a climate change initiative that outlines a strategy for dealing with effects of drought, reduced stream flow, and associated effectscharacterize effects of climate change. FWS and TNC are working with Reclamation to define endangered fish flow recommendations as an environmental metric in the Colorado River Basin Study to help resolve projected future water supply and demand imbalances. The final report will be available in the summer of 2012; updates of this effort are planned every 5 years. (See http://www.usbr.gov/lc/region/programs/crbstudy.html .)
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.B.2.b.	Investigate age-0 and age-1 humpback chub mortality (especially in Black Rocks/Westwater and Desolation canyons) as recommended in the Research Framework.	TBD	Pending		X	X	X			Program needs to determine how to investigate age-0 and age-1 humpback chub mortality (especially in Black Rocks/Westwater and Desolation canyons) as recommended in the Research Framework.
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	! Standardization of electrofishing equipment and technique for inflatable boat nearly complete.
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	

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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	The Recovery Program worked with the Colorado Foundation for Water Education to provide 100 bus tour participants with a tour of the GVVUA fish passage and screen. Recovery Program also participated in re-opening celebration of Dinosaur National Monument Visitor Center and Quarry (1000+ visitors).	
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		
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	X PD's office still 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.							
VII.A.5.d.(1)	Update recovery goals and then revise recovery plans.	PD/FWS	Pending	X	X					In progress. Recovery Program requests coordination with the Service on recovery goal/plan revision; WAPA has asked FWS to reconvene recovery team (and requests this be added to the RIPRAP, as in VII.A.5.a., above). FWS currently discussing convening recovery team(s).	
VII.A.5.e.	Conduct species status review every 5 years. See http://www.coloradoriverrecovery.org/documents-publications/foundational-documents/recovery-goals.html .	FWS/Program	Every 5 years	X					X	No change in status proposed. Pikeminnow and humpback chub reviews complete. Draft razorback sucker and bonytail reviews in surnaming process.	
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 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	http://www.coloradoriverrecovery.org/documents-publications/foundational-documents/publiclaw/ReporttoCongress.pdf							Non-Federal Program participants continue to provide information in response to questions from House Natural Resources Committee Subcommittee on Water and Power.
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 2011

Facility	Species	Target	Stocked	Percent
Grand Valley	Razorback sucker	14,895	19,041	128%
Ouray	Razorback sucker	14,895	14,510	97%
Wahweap	Bonytail	10,660	22,785	214%
Mumma	Bonytail	5,330	7,237	136%

Razorback sucker stocked by river				
Facility	River	Target	Stocked	Percent
Grand Valley	Upper Colorado	6,620	8,688	131%
	Gunnison	3,310	3,331	101%
	Lower Green	4,965	7,022	141%
Ouray	Middle Green	9,930	9,036	91%
	Lower Green	4,965	5,474	110%

Bonytail stocked by river				
Facility	River	Target	Stocked	Percent
Wahweap	Middle Green	2,665	10,751	403%
	Lower Green	5,330	7,854	147%
	Colorado	2,665	4,180	157%
Mumma	Middle Green	2,665	2,833	106%
	Colorado	2,665	4,404	165%

Percentages in 2011 are considerably larger as a result of the fish held over from 2010 due to largemouth bass virus outbreak at Dexter NFH.

See above.

See above.

GREEN RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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 was dictated by extremely high snow pack in the spring 2011; a good year to launch the larval trigger program. April-July runoff was predicted as 145% of avg.; resulting spring flows were approximately double the duration and above the peaks in the flow recommendations for a wet year. The Recovery Program's 2011 Spring Flow Request was tiered to forecasted hydrologies, but our 'wet' condition scenario asked for 18,600cfs or greater for two weeks or more in Reach 2 after razorback sucker larvae were detected. Larvae were detected in the Green river on June 23, flows were above 18,600 cfs at Jensen for nearly 3 weeks after larvae were detected. Base flows were >3,000 cfs from July 15 to October 1st. Research is underway to determine the effect of moving more larvae on the floodplain and whether higher base flows may disadvantage nonnative species.
	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	! This work was expanded into floodplains in response to extremely high 2011 flows and Recovery Program spring flow request.
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			Utah's Green River Utah Water Acquisition Team (GRUWAT) is reviewing a draft minimum flow model to evaluate current and full compact water use. More model runs will be requested.
	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						
	I.A.4.b.(2)(d) Amalgamate technical information needed to model and resolve modeling issues.	UT	In progress	X						Nearing completion.
	I.A.4.b.(2)(e) Develop model to analyze historic and future scenarios	UT	In progress	X						Model in testing phase.
	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			

GREEN RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
>*	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						BC discussed June 2011 revised draft in September 2011; PD responding to last set of comments received 11/11/11.	
	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	Green River Study Plan ad hoc Committee (2007). Study Plan for the Implementation and Evaluation of Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge.							
	I.D.1.a. Evaluate survival of young and movement of subadult razorback suckers from floodplains into the mainstem in response to flows.	UDWR	Ongoing	X						Hedrick et al. in draft. Program will review recommendations and discuss future direction (e.g., conducting similar work at Stewart Lake)	
	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	Bestgen, K. R., G. B. Haines, and A. A. Hill. 2011. Synthesis of flood plain wetland information: Timing of razorback sucker reproduction in the Green River, Utah, related to stream flow, water temperature, and flood plain wetland availability. Final Report to the Upper Colorado River Endangered Fish Recovery Program, Denver. Larval Fish Laboratory Contribution 163.							
	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							In October of 2011 the Recovery Program approved the USGS sediment report on the Gunnison River in Colorado and the Green and Duchesne Rivers in Utah (FR-Sed Mon); it is in the USGS print process and the title is still draft. The next step is to interpret this physical science as it applies to / validates the endangered fish flow recommendations.	
	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	Complete	Bestgen, K. R., G. B. Haines, and A. A. Hill. 2011. Synthesis of flood plain wetland information: Timing of razorback sucker reproduction in the Green River, Utah, related to stream flow, water temperature, and flood plain wetland availability. Final Report to the Upper Colorado River Endangered Fish Recovery Program, Denver. Larval Fish Laboratory Contribution 163.							!Bestgen et al. provided 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. Larval Trigger Study Plan drafted in 2011; being reviewed by Biology Committee.
	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	Work will be expanded to include Larval Trigger Study Plan.	
	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; draft final report due in 2012.	
	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		
	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						See I.D.1.d for reference to an ongoing, and more comprehensive synthesis of related data.	

GREEN RIVER ACTION PLAN: MAINSTEM

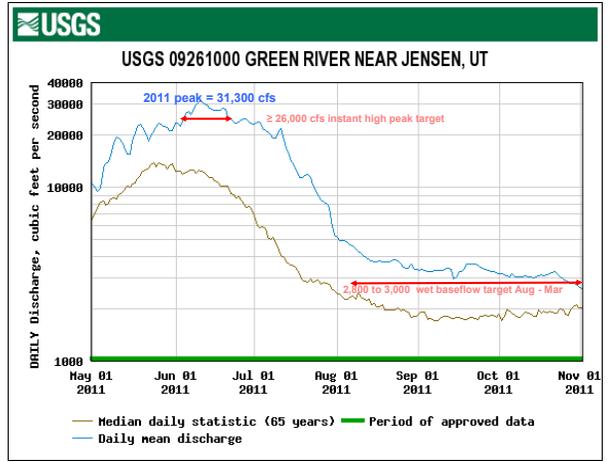
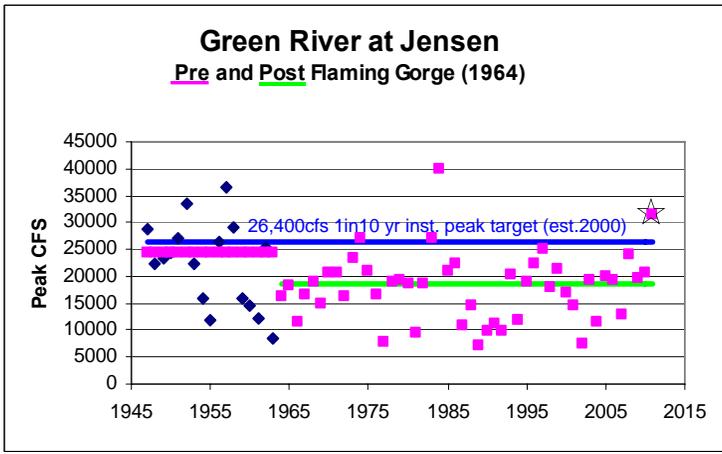
	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
I.D.1.f.	Determine influence of flow and temperature recommendations on entire fish community with emphasis on nonnative fish life history in lower Reach 1 and upper Reach 2.	LFL/FWS	Ongoing	X						Project FR-115, "Effects of Flaming Gorge Releases on Lodore/Whirlpool Canyon Fish Community", will provide ongoing evaluation of Flaming Gorge operations. BC recommends PI's focus reporting on the effects of environmental conditions on smallmouth bass early life history (otolith examination)(see General, IIIA2c1).
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). At the 2011 NNF workshop, Eric Gardunio advised that electrofishing is unlikely to be an efficient sampling technique for burbot, but netting may be effective.
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							BLM was awarded a grant to draft a San Rafael management plan; Justin Jemenez lead.
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 OCW 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							High flows damaged Thunder Ranch levee in 2011; being repaired in 2012.
	II.A.3.d. Evaluation.	FWS	Complete							
	II.A.4. Develop Green River Subbasin Floodplain Management Plan	Program	Complete							

GREEN RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
>*	II.A.4.a. Implement, validate and refine Green River Subbasin Floodplain Management Plan	Program	Ongoing	X	X	X	X	X	X	! High spring flows in 2011 provided for significant floodplain connection (40 days > 18,600 cfs; 19 of those days occurred after RBS larvae were detected) throughout Reach 2 of the Green River. C6 RZ / RECR (Stirrup floodplain) - 6,804 Age-2 bonytail (2009 age class; 205 mm average when tagged previous fall) were stocked by Wahweap Fish Hatchery on 4/7/2011. During the extensive period of riverine connection (96 days; site connects at ~15,000cfs) at the Stirrup a total of 1,216 unique fish were detected (1,129 recently stocked bonytail; 63 RBS; and 13 CPM; and one fish unaccounted for); another unmarked CPM was collected later in the year in the floodplain while netting. Wild-produced RBS were captured in two floodplain habitats (Wyasket lake and Leota 4) in the fall - the first collection of wild produced RBS since 1996!
	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				Program needs to act on ad hoc committee's recommendation to initiate a mortality study at Tusher Diversion. Current thinking is to combine field mortality study results with literature review to provide the Program with a viable set of alternatives.
>*	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! UDWR continued their must-kill policy for burbot and the week-long burbot "round-up" in Flaming Gorge (January 2012)); walleye captures have increased in upper and lower Green; gizzard shad have been found in lower Green River backwaters since 2007 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.									An illegal population of walleye in Red Fleet Reservoir is also believed to be a problematic source of this species entering the Green River and has been recommended for reclamation (rotenone). A microchemical analysis of otoliths from Red Fleet reservoir and river is underway to better understand the contribution of walleye to critical habitat from this potential source population.
	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.						
>*	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.
>*	III.A.4.a. Northern pike in the middle Green River.	UDWR/FWS	Ongoing	X	X	X	X	X	X	Northern pike were detected in the Thunder Ranch wetland in 2011. This high density northern pike population/source is scheduled for suppression (netting) or eradication (piscicide) in spring 2012.

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	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
	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					Project 158 suspended in 2011 due to high flows; expected to resume with revised sampling strategy in 2012.
>*	III.A.4.b.(3){2} Smallmouth bass in middle and lower Green River.	UDWR/FWS	Ongoing	X	X	X	X	X	X	UDWR reports high densities of juvenile smallmouth bass below the Duchesne River; removal effort in 123b to be redistributed accordingly.
>*	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	See General Action Plan, IV.B.2.
	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	See General Action Plan, IV.B.2.
	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	BC approved Badame's report in January 2012.
	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	3-year Green River population estimates resumed in 2011; age-0 captures low (as expected under high baseflow conditions).
	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							Behind schedule; see General Action Plan, V.A.1.a.



GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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	NPS is currently funding a synthesis of information (on sediment, riparian resources, and the native fish community) that will be provided for Recovery Program review, and which may support a future peak flow recommendation for the Yampa River by the Recovery Program.
I.B.	<u>Yampa River above the Little Snake River.</u>									
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							

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
>*	I.B.2.a.(2)(b) Deliver water for endangered fish.	Program	Ongoing	X	X	X	X	X	X	! 2011 brought record high flows. In late August, 2011, the Colorado River Water Conservation District, USFWS, and the Recovery Program coordinated an experimental release of 300cfs from the Elkhead Reservoir Fish Pool to benefit native and endangered fish and assist in late season nonnative fish removal in the Yampa River mainstem near Maybell, CO. Releases from the 5000 af + 500 af (leased in 2010) pool totaled 1,820 af from August 18 – 22, with a peak of 901 cfs on Aug 21st. In scheduling this release, biologists worked closely with local farmers who cross the Yampa to access their fields. 3,680 af of the 5000 af + 500 af pool was left in the reservoir due to high flows in August through October averaging 634 cfs. Flows reached a low of only 312 cfs on October 4 at Maybell.
	I.B.3. Evaluate need for instream flow water rights.									
	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. Revisit the need for instream flow filings or other flow protection mechanisms at least every 5 years.	CWCB/FWS/ WAC						X	X	In July and November 2011, the WAC determined that additional permanent protection in the form of instream flow filings was not deemed necessary at that time. By September 30, 2016, per the 5 year period (or earlier should conditions dictate), the WAC will review mechanisms of current flow protection to determine if additional mechanisms or instream flow filings are needed at that time. The determination for additional protection rests with the Program and WAC, but will be recorded within the CWCB depletion reports due every 5 years. It appears unlikely that there have been significant new depletions in the Yampa, but we are still examining our ability to model past depletion trends in the Yampa River accounting (see note for I.B.4, below). If significant new depletions are projected or proposed in excess of those in the Yampa PBO, then flow protection may be warranted even if the current level of depletions has not changed much at all.
	I.B.4. Provide a depletion accounting report as outlined in the Yampa River PBO; including 1) calculation of past depletions every 5 years as a 10-year moving average as determined by CWCB and reported to FWS & the Program; 2) a back-casted baseline of current depletions that can be used in projecting the impact of significant new depletions; and 3) a recommendation and justification regarding whether or not additional instream flow filings or other flow protection mechanisms should be considered in light of projected future depletions and other factors.	CWCB/FWS	Pending	X				X	X	X (overdue) The CWCB will provide-an accounting of past depletions for the Yampa River using StateCU and will address potential changes in the baseline for current depletions in the spring of 2012.
	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. Revisit the need for instream flow filings or other flow protection mechanisms at least every 5 years.	CWCB/FWS/ WAC						X	X	See I.B.3.e.

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

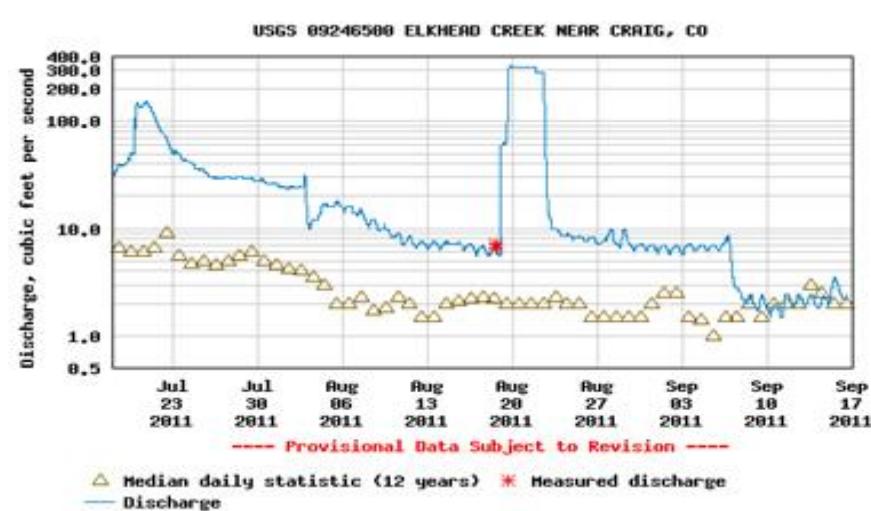
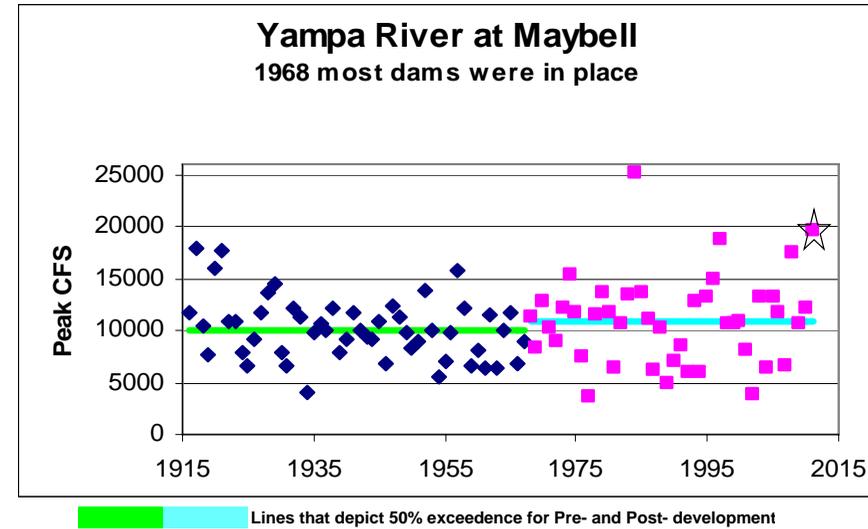
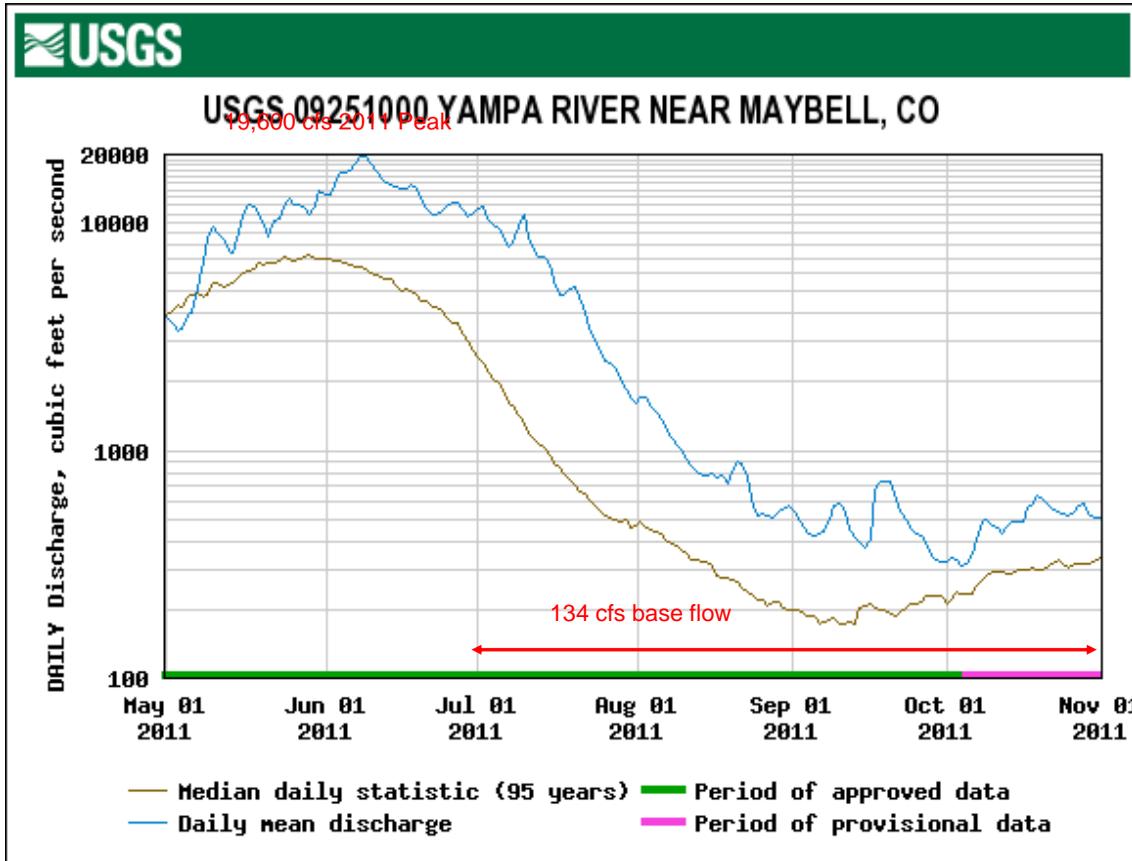
	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
I.C.3.d.(1)	If necessary, evaluate how identified flows will be legally protected.	CWCB/ Wyoming	Pending						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.	Yampa River below Little Snake River									
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.	Revisit the need for instream flow filings or other flow protection mechanisms at least every 5 years.	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.	Revisit the need for instream flow filings or other flow protection mechanisms at least every 5 years.	CWCB/FWS/ WAC						X	X	See I.B.3.e.
I.D.2.d.(1)	If necessary, evaluate how identified flows will be legally protected.	CWCB	Pending						X	
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)									
II.A.	Yampa River from Dinosaur National Monument to Craig, Colorado									
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					! PIT-tag reader installed in Maybell Ditch to evaluate entrainment in 2011 (no fish detected) and 2012.
>* II.A.2.b.	Develop and implement remedial measures, as necessary, to reduce or eliminate entrainment.	PD/CPW/ 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							
III.A.2.	Develop Yampa River Nonnative Fish Control Strategy (Program)	Program	Complete							
>* III.B.	Implement CPW 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/ CPW	Ongoing	X	X	X	X	X	X	CPW Yampa Basin Aquatic Plan does not specify timeline for removing/controlling northern pike numbers/habitat above Hayden/"buffer zone". Recovery Program recommends expedient removal/control of northern pike in an upstream to downstream approach; however, sources of northern pike throughout the river basin must be addressed-to avoid rapid reinvasion.
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.						

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
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/ CPW	Ongoing							! X CSU's completed draft report containing conservative estimate of escaped tagged smallmouth bass translocated into Elkhead Reservoir from the Yampa River indicates high escapement rates both pre- and post-reservoir enlargement (report in review). This estimate does not include untagged resident smallmouth bass which are presumed to escape at a similar rate. The high risk to endangered fish indicated by this analysis mandates an adaptive management response from the Recovery Program (e.g., reclamation [rotenone] and renovation [restocking] of the existing reservoir fish population and replacement with a sport fishery compatible with efforts to recover endangered fishes; or, in the near-term, mechanical removal of problematic smallmouth bass and northern pike from the reservoir to suppress their density). Escapement of tagged northern pike from Elkhead Reservoir has occurred and an estimate of northern pike abundance in 2011 indicates a high density population of this species in the reservoir.	
>* 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/CPW		X	X	X	X	X	X	X No action to date on this concept in the Yampa River. See General, III.B.8.	
III.B.1.c.	Remove northern pike and smallmouth bass above Craig, CO (YS C-3)	CPW	Ongoing	X	X	X	X	X	X	Based on the 2011 Nonnative Fish Workshop discussions, FWS will focus removal efforts immediately pre- and post-runoff. The Recovery Program has recommended the resurrection of elements of Project 98c to provide removal/reconnaissance of northern pike densities/habitats above Hayden/"buffer zone" to facilitate northern pike suppression and the reduction of their density in critical habitat. At minimum, CPW will conduct a couple of removal passes within the critical upper portion of 98c reach.	
III.B.1.d.	Target spawning areas (YS C-4)										
III.B.1.d.(1)	Northern pike.	Program	Ongoing	X	X	X			X	CPW has continued work at Catamount Reservoir to reduce northern pike and rusty crayfish numbers. CPW also has plans to eradicate the illegally-established population of northern pike in Chapman Reservoir (also see discussion for Yampa III.B.1.d.(1)(b)).	
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.	CPW	Ongoing	X	X					On January 12, 2012 the BC reviewed and discussed available data and implications of channel/floodplain modification to the Yampa River at the Walton Creek confluence near Steamboat Springs (SBS), CO. CPW recommended partnering with SBS to acquire GOCO grant to re-align existing stream channel and fill-in wetlands and gravel pits to reduce/eliminate reproduction, recruitment or holding habitats for northern pike. BC declined opportunity based on insufficient northern pike density/distribution data in upper Yampa River, extent and risks associated with channel/wetland modifications, and lack of comprehensive plan or timeframe to undertake removal/reduction/eradication of northern pike in all habitats including reservoir or riverine habitats. (X) Program and CPW should develop a drainage-wide action plan and timeline to address Yampa River basin northern pike management.	
III.B.1.d.(1)(c)	Develop guidelines for new structures to minimize creation of habitat suitable for pike spawning/nursery.	CPW	Ongoing							Pat Martinez and the PD's office will work with CPW to better define this task.	

GREEN RIVER ACTION PLAN: YAMPA AND LITTLE SNAKE RIVERS

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
>*	III.B.1.(d)(2) Smallmouth bass	Program	Ongoing	X	X	X	X	X	X	Efforts to reduce densities of this species in river reaches such as Little Yampa Canyon appear to be hampered by the immigration of smallmouth bass from upstream sources sustaining propagule pressure and proliferative/invasive capacity of this species. 2011 and 2012 work revised to increase removal / disruption further into the smallmouth bass spawning period (e.g., sampling schedules being extended to exploit smallmouth bass in post-peak flows on the Yampa).	
	III.B.1.e. Assess food web/contaminant impacts of nonnative aquatic species in the Yampa River.	TBD	Pending	X	X					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). Program Director's office recommends a pilot trophic stable isotope analyses (tissue sampling). Part of this work would include exploring role of crayfish in mobilizing mercury into the food web (which may have negative implications for endangered fish reproduction). PD's office recommends seeking an outside funding source in light of presently limited Program funds.	
	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)	CPW/FWS	Ongoing	X	X	X	X	X	X		
>*	III.B.2.e. Remove (formerly "and translocate") smallmouth bass. (YS J-1)	CPW	Ongoing	X	X	X	X	X	X		
	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	X	CSU reports that compared to early sampling (2003-2004) in Project #140, native species richness in Little Yampa Canyon has increased as has frequency in samples and abundance of native fishes, particularly since 2008. Comparison of native fish frequency and abundance in a control and treatment reach suggested that both non-native predator removals, as well as environmental effects due mostly to higher water, are responsible.	
	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.	<u>Yampa River in Dinosaur National Monument</u>										
IV.A.1.	Augment or restore populations as needed, and as guided by the Genetics Mgmt. Plan.										
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/CPW	Ongoing	X	X	X	X	X	X		
	IV.A.1.b. Research the survivability of young-of-year Gila 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	2011 chub monitoring documented a bonytail in the Yampa River that had survived from the 2010 Echo Park stocking in September.	
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	Researchers recommend continuing monitoring and tagging chub. Recaptured fish are becoming more common from previous tagging, and fish from the Green River have been captured.	



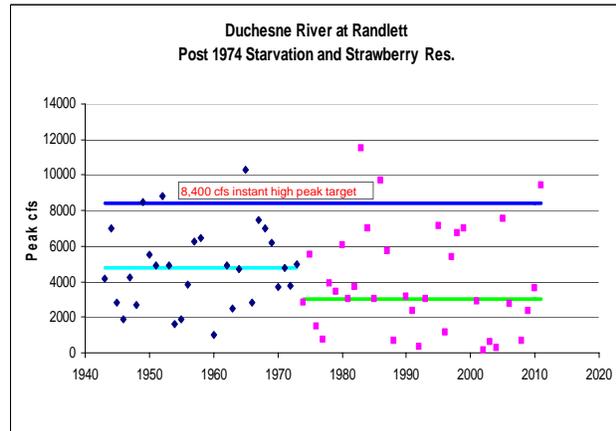
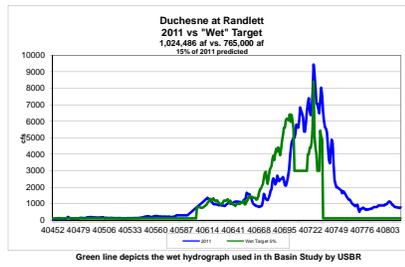
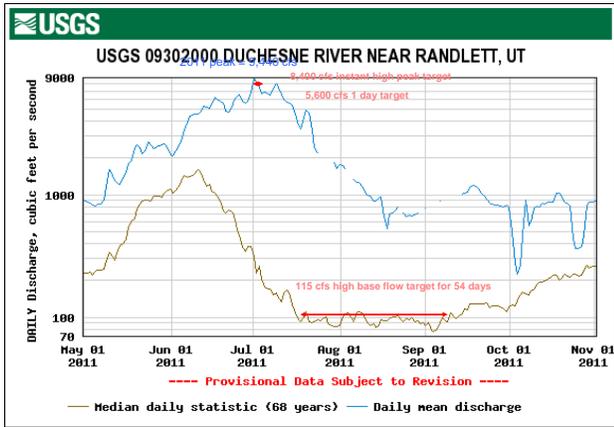
August 18 – 22, 2011 releases from the 5000 af CWCB Pool totaled 1820 af to assist biologists in removing nonnative fish. Elkhead Reservoir endangered fish pools are managed to ensure minimum flows of at least 93–134 cubic-feet-per-second (cfs; preferably 120 cfs or greater) at the Maybell gage during August–October. A caveat is that 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 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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.						Flow recommendations met in 2011 for an Extremely Wet Year (see Assmt tab): the Duchesne River at Randlett peaked at 8,450 cfs, which exceed the 'extremely wet year' instantaneous peak flow recommendation of 8, 400 cfs. During spring runoff there were 41 days above 4000 cfs and no days below the 115 cfs target during baseflows. Since 2004, two years (2005 and 2011) have produced flow events generating cfs-days above 4,000 cfs. In 2005, there were 34,190 cfs-days above 4,000 cfs and 2011 produced 95,400 cfs-days above 4,000 cfs. With these two years, the 7,000 cfs-days average will be maintained without any additional high flow events until the year 2022.
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						Progress has been made since the BO. A water management report (chronicling how the flow recommendations have been met since 2004, 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 which has been reviewed by the Service and comments provided back to CUWCD. CUWCD will provide an updated report to the DRWG in the spring of 2012. 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							
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	
>* I.D.2.a.	Rehabilitate Myton Town diversion.	BR/CUWCD/ UT/Ute Tribe	Complete							
I.E.	Examine the feasibility of other options for obtaining water.	BR/DOI/PD/ UteTribe	Ongoing	X	X	X	X	X	X	
I.F.	Determine need and feasibility of additional gaging.	BR/FWS/UT	Complete							
I.F.1.	Construct additional gages, as needed.	TBD	Complete							

GREEN RIVER ACTION PLAN: DUCHESNE RIVER

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
I.G.	Evaluate and revise as needed, flow regimes to benefit endangered fish populations	FWS/Program	Ongoing	X	X	X	X	X	X		
III.	REDUCE NEGATIVE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)										
III.A.	Reduce negative 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 walleye caught in the Green River have Starvation markers.
III.A.3.b.(1)	If feasible and necessary, screen Starvation Reservoir	N/A	May need to be revisited								Starvation Reservoir appears to be a chronic source of walleye entering the Green River and should be addressed/remediated; however, screening has a low probability of success; therefore, other measures should be pursued.
>*	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 may implement nonnative fish removal on the Duchesne (in-kind support).	



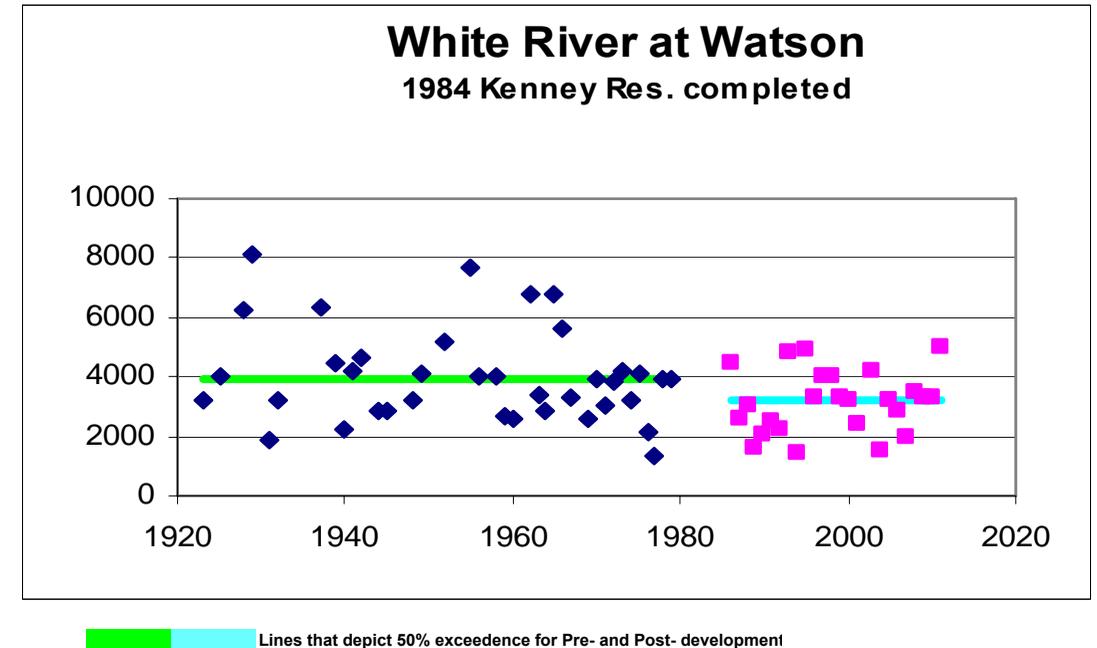
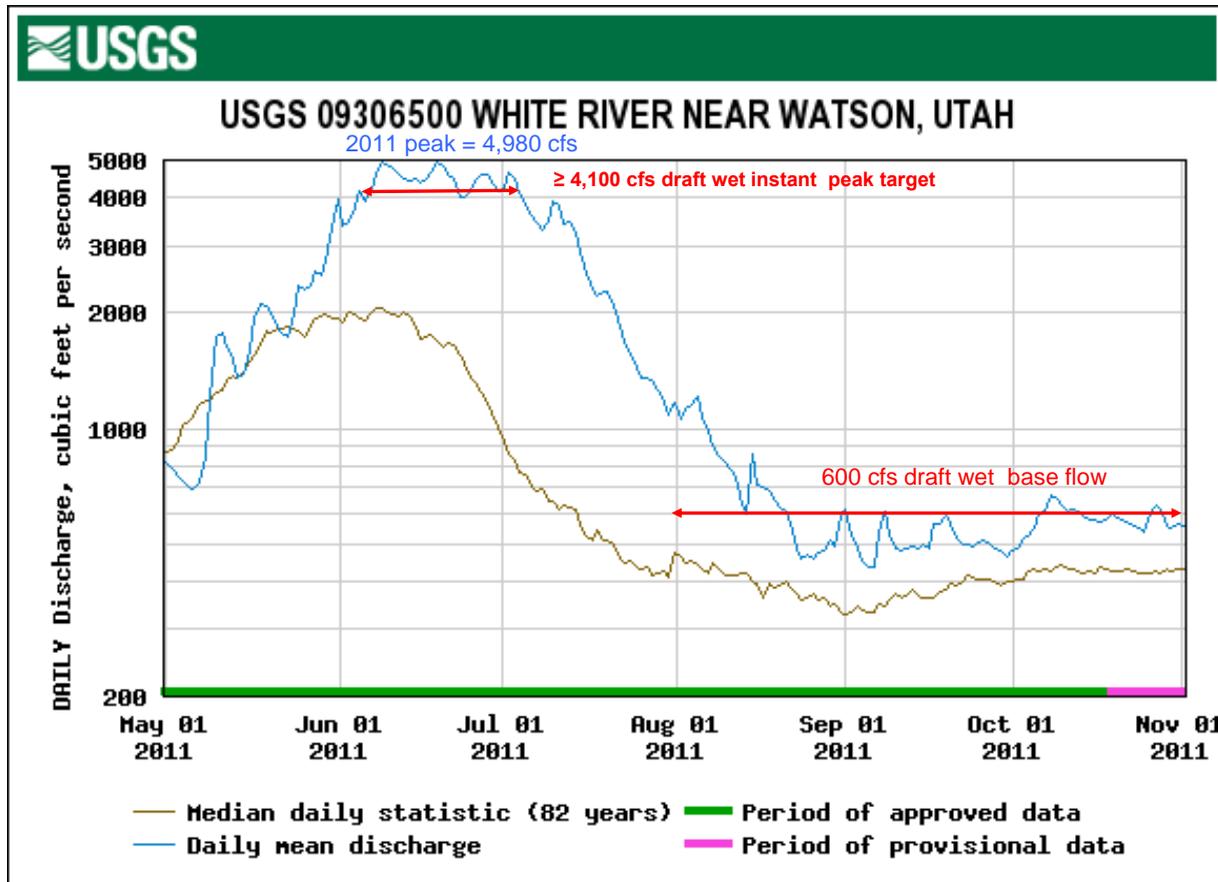
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GREEN RIVER ACTION PLAN: WHITE RIVER

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
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 (Haines et al. 2004).	FWS-FR	Pending	X						X Overdue. Program Director's staff submitted draft revised White River flow recommendations on July 1; final comments received in November; next draft anticipated in mid-2012.	
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								
>* I.E.2.c.	Implement process for streamflow protection.	UT	Pending	X	X						
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 nonnative fishes in Kenney Reservoir (especially black crappie and channel catfish).	CPW	TBD	Initial assessment completed. If fish stocked in the future, escapement will need to be monitored. Elmblad 1998.							PD's office recommends CPW continue to routinely sample Kenney Reservoir to determine status/source of smallmouth bass. CPW sampled Kenney in 2007, 2008, and 2010 and has not detected smallmouth bass.
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 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
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. At 2011 Nonnative Fish Workshop, researchers reported increasing abundance of smallmouth bass; Program scheduled to begin specific effort to remove smallmouth bass in 2012. CPW will propose removing bag limit for smallmouth bass (and other nonnative sport fishes) in the 400 yards below Kenney Reservoir that still has limits in 2013. Recovery Program supports multi-agency effort to designate White River as native fish conservation area.	
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.									! Researchers documented razorback suckers spawning in the White River for the first time. White River Work Group met December 14, 2011, to determine native fish priorities for the White River in Utah; 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 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
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) and record within the depletion report the Program and WAC determination regarding whether or not additional instream flow filings or other flow protection mechanisms should be considered.	CWCB	Pending	12/31/2011				X	X	X (overdue) The CWCB will provide the depletion accounting for 2006-2010 for the Upper Colorado River using StateCU in the spring of 2012. If the amount of consumptive use, location of use, and timing of use is not the same as in the past, they would then put that information into StateMod to show how those changes affect the river.	
	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) Revisit the need for instream flow filings or other flow protection mechanisms at least every 5 years.	CWCB/FWS						X	X	By September 30, 2016, per the 5 year period as required in the PBO (or earlier should conditions dictate), the WAC will review mechanisms of current flow protection to determine if additional mechanisms or instream flow filings are needed at that time. The determination for additional protection rests with the Program and WAC, but will be recorded within the CWCB depletion reports due every 5 years. The WAC discussed this in July and November 2011 and determined that additional permanent protection in the form of instream flow filings was not deemed necessary at this time. It appears unlikely that there have been significant new depletions in the Colorado River.	
	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) Revisit the need for instream flow filings or other flow protection mechanisms at least every 5 years.	CWCB/FWS	On hold					X	X	See I.A.4.a.(3), above.	
	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							
	I.A.4.c.(2) Irrigation season return flows legally protected - 300 cfs.		Complete	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.5. Provide and legally protect instream flows pursuant to Colorado River PBO.									! A total of 78,896 af was added to baseflow in water year 2011; this included 31,880 af from Green Mountain (assisted by Grand Valley Water Management), 20,466 af from Ruedi, 4,871 af from Williams Fork, 7,572 af from Wolford Mountain Reservoir, and 20,466 af from the Palisade Bypass Pipeline (see Assmt-CR worksheets). Coordination consists of 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.

COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
>*	I.A.5.b.(1) Provide water annually pursuant to long-term lease.	BR/CWCB	Ongoing through 2012.	X							
	I.A.5.c. East and West slope water users provide 10,825 af pursuant to 15-Mile Reach PBO										
	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 PBO, 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					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 PBO, 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					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 February 2012 then contracts will be negotiated; interim 10,825 being delivered.
	I.A.5.c.(2)(c) Sign agreement(s) for permanent delivery of 10,825.	Water Users	Pending	X						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	X		
	I.A.5.d. Evaluate options for use of uncommitted Ruedi Reservoir water following Round II sales.	BR	Complete	On May 28, 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). USEWS							
	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 high snowpack and near-record breaking peak flows there was no CROS in 2011 (to avoid flooding and also CROS unneeded to achieve peak).	
	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 10,370 af greater than 1998 benchmark; however, 20,466 af returned through Palisade pipeline, resulting in a total potential benefit to the 15-Mile Reach of 10.096 af in water year 2011.	
	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								

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	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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									
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						OMID, CWCB, River District and Reclamation working out final payment details for 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 Overdue. Completion of CFOPS Phase III should be out in draft early spring of 2012.
>* 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/CPW	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	Complete	Aspinall Unit Study Plan ad hoc Committee. (2011) Study Plan to Evaluate Effects of Aspinall Unit Operations to Benefit Habitat and Recovery of Endangered Fishes in the Gunnison and Colorado Rivers. Coordinated by the Upper Colorado River Endangered Fish Recovery Program						! Aspinall Study Plan completed in April 2011.
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)	BR			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.	BR			X					

COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
I.B.5.a.(3)	Repeat depth-to-embeddedness 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)	CPW/FWS	Ongoing	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)	FWS/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.	<u>Colorado River from Colorado-Utah State line to Green River</u>									See also I.B.4.c.(3)	
I.C.1.	Initially identify year-round flows needed for recovery.	FWS-FR	Complete	McAda 2003.							
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	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.										
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	Earthen dikes and water control structures completed in spring 1995. 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.b.	Site design/complete environmental compliance.	BR	Complete								
>* II.A.2.c.	Construct.	BR	Complete								
>* II.A.2.d.	Operate and maintain.	BR	TBD, revisit as needed								
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)							CPW 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.							

COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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							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.b.	Construction (levee breaching) [NOTE: Subject to review and approval for depression wetlands.]	BR	Complete							
>* II.A.4.c.	Operate and maintain.	BR/FWS	Complete							
II.A.4.d.	Evaluation	FWS	Complete							
II.A.5.	Acquire interest in high-priority flooded bottomland habitats.									Program will remove sediment build-up at the Jarvis pond inlet/outlet structure this winter (same as work performed in October 2003 and fall 2010).
II.A.5.a.	Identify and evaluate sites.	FWS	Complete							
II.A.5.b.	Pre-acquisition planning and identification of acquisition options.	PD	Complete							
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							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.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 reclaimed (rotenone) in March 2012.
II.B.	Restore native fish passage at instream barriers.									Meetings were held in April and December 2011 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	Screens were inoperable for 45 days total during runoff, due to debris and the bypass pipe not drawing. Ran 14 days in June, 10 days in July, 3 days in August-September. The screens were operated 59% of the time this year due to high river and excessive debris (compared to 68% 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. Between October 2010 and September 2011, 117 individual fish were detected in the Price Stubb passage: 81 razorback sucker, 16 bonytail, 1 Colorado pikeminnow, 17 roundtail chub, 1 flannelmouth sucker, and 1 unknown.
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							

COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
>*	II.B.3.a.(3) Operate and maintain.	BR	Ongoing	X	X	X	X	X	X	! Passage operated continuously April 19 to October 14 in 2011; three humpback chub and 22 bonytail were collected. To date, 2 razorback sucker, 6 humpback chub, and 22 bonytail used the fishway. 8,870 fish were processed in 2011. To date, 67,071 fish have used this fish passage 2005-2006 and 2008-2011. Flannelmouth sucker and bluehead sucker comprised 33 % and 25% of the all fishes in the fish trap and white sucker and brown trout comprised 16% and 2%. Native fishes comprised 86% of the total fish during 2011, compared to 89% in 2010, 91% in 2009, and 90% in 2008.	
	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	2010 operations report pending.	
	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	The Grand Junction EC staff has remained involved with both the Gunnison Basin Selenium Task Force and Grand Valley Selenium Task Force.	
	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.	CPW/FWS	Ongoing							See General, III.C.	
	III.A.4.b. Screen Rifle Creek below Rifle Gap Dam (non-Program funds).									The intent of the Stocking Procedures is that screens be applied to control escapement of fishes that are compatible with endangered fish recovery. Northern pike and smallmouth bass remain of extreme concern due to their demonstrated invasive potential in UCRB rivers and their potential to establish invasive populations of these species from Rifle Gap Reservoir. Additional removal in 2012 will focus on northern pike in Upper Colorado River near Rifle Creek confluence.	
	III.A.4.b.(1) Design with appropriate peer review	CPW/BOR /FWS	Complete	! A good screen design was prepared and given a thumbs-up by two independent reviewers.							
>*	III.A.4.b.(2) Construct screen	CPW	Pending	X	X					Construction delayed due to CPW funding delay.	
	III.A.4.b.(3) Finalize lake management plan, per Nonnative Fish Stocking Procedures	CPW	Pending	X	X					CPW anticipates completing LMP in 2012.	
	III.A.4.b.(4) Conduct follow-up monitoring prior to and following stocking to determine effectiveness of screen.	CPW	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.	

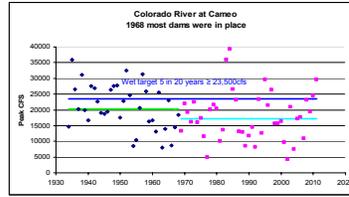
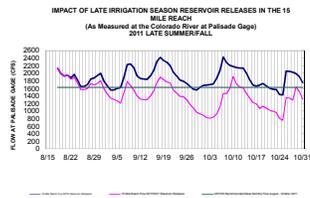
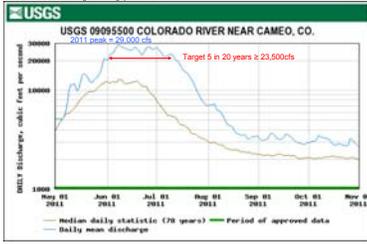
COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
>*	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	In 2012, additional passes will be devoted in the reach of the Colorado River from Rifle to the Beavertail to remove invading northern pike. CPW will conduct a reconnaissance in floodplain & canal habitats to identify potential sources of this species. Sampling will also be conducted from Silt to Rifle to remove northern pike.
	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.	CPW	Ongoing	X	X	X	X	X	X	! Guidelines for unscreened outlet releases incorporated into project scope of work. CPW scheduled to replace net in fall 2012.
	III.B.1.b. Evaluate Highline Reservoir net.	CDOW	Complete	Martinez 2002.						
	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 CPW's Colorado River Aquatic Management Plan.	CPW	Ongoing	X	X	X	X	X	X	
	IV. MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES)									
	IV.A. Augment or restore populations as needed, 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	Burrnick 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.	CPW/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/CPW	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	

COLORADO RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)	
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).							
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 and Francis and McAda 2011.	FWS	Ongoing	X					X		
V.C.2.	Westwater. See Hudson and Jackson 2003.	UDWR	Ongoing	X					X	2007-2008 report (Elverud 2012) being finalized.	
V.C.3.	Cataract Canyon	UDWR/Valdez	Ongoing	X	X	X	X	X	X	Cataract Canyon sampling is now biennial CPUE.	
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	X	X	Draft report for 2008-2010 estimates behind schedule (data analysis prolonged due to PIT tags/readers change); report now anticipated 5/15/12.	

Please scroll down and to the right to see all graphs on this tab.

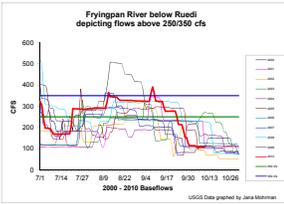
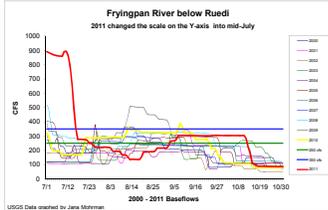


Target on Colorado R. at Cameo:
5 in 20 years is 23,500 cfs

In 17 years since CROD began (1999)

June 16, 1999	28,600
June 6, 2011	23,300
June 6, 1997	26,300
June 6, 2010	24,500
May 26, 1995	23,300
June 4, 2008	23,100

By Judy Sappington, Water Rights Specialist, DWR, Division 5
1630 cfs was the target for base flow in 2011 (wet year target)



Coordinated Reservoir Operations

	Peak Flows (ac-ft)							
	1997	1998	1999	2006	2008	2009	2010	2011
Granby			8,515					0
Green Mtn	3,568	12,442	11,010	6,788	2,101	14,113	34,666	0
Ruedi	633	5,106	3,602	6,291	4,843	5,858	10,050	0
Williams Fork	946	1,672	1,543	6,625		5,044	19,982	0
Willow Creek			6,631			2,638		0
Windy Gap						2,061		0
Wolford Mtn	10,635	4,431	8,555	9,007		13,069	9,273	0
Total Ac-Ft	15,842	23,691	39,856	28,717	6,949	42,783	73,971	0

Total 231,809 ac-ft
Average 33,116 ac-ft

Reservoir contribution from 1997 - 2011 for spring and summer flows to the 15-mile reach of the Colorado River

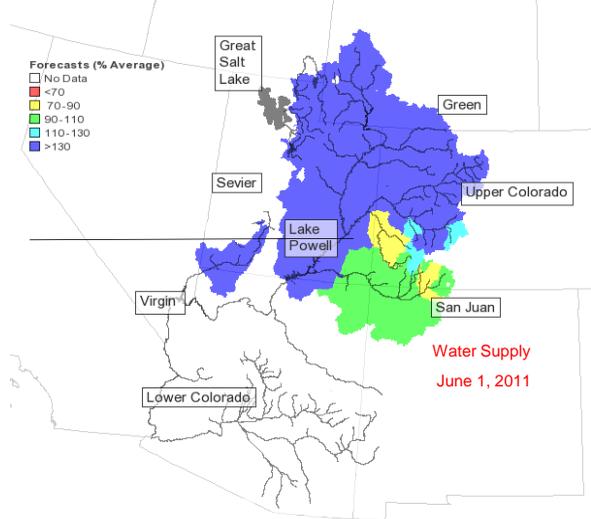
Reservoir	Acre-Feet
Granby	39,914
Green Mtn	532,000
Palisade Bypass	93,038
Ruedi	272,287
Williams Fork	89,342
Willow Creek	9,852
Windy Gap	3,718
Wolford Mtn	137,879
Total	1,178,030

Base Flows (ac-ft) for the 15-Mile Reach

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Granby		24,223										2,574	4,602	
Green Mtn	28,562	32,098	42,468	31,118	0	42,774	101	28,080	22,822	29,470	55,290	50,661	52,032	31,680
Palisade Bypass					2,235	6,609	7,043	10,076	0	8,944	12,000	11,905	13,760	20,466
Ruedi	18,722	18,376	17,158	19,210	9,877	18,901	14,782	15,876	18,204	13,203	18,892	19,281	19,263	14,107
Williams Fork		1,642	3,472	4,832	3,381	3,381	2,410	3,433	4,871	2,155	9,340	4,870	4,872	4,871
Willow Creek			584											
Windy Gap										764			893	
Wolford Mtn	10,364	4,445	9,968	7,719	277	257	900	9,580	6,155	9,389	7,873	7,572	7,572	
Total Ac-ft	57,648	81,278	73,063	62,879	15,770	71,922	24,342	56,366	55,477	59,921	105,674	97,143	102,994	78,896

Total = 946,220 acft
Average 67,587 acft

Total for program combined CROS & Base Flows = 1,178,030 acft



Upper Colorado River Annual Volumes

River	Gage	Period of record	2011 Volume Ranked
Yampa	Deerlodge	27	1
Yampa	Maybell	97	1
Colorado	Cameo	79	2
Green	Jensen	66	3
Green	Green River	108	3
Duchesne	Randlett	69	3
White	Watson	82	3
Colorado	Stateline	59	8
Price	Woodside	57	8
Gunnison	Grand Junction	103	63
San Juan	Bluff	84	67

River	Gage	Date of Peak	Magnitude (cfs)	Period of record	Ranked	Peaks removed
Yampa	Deerlodge	9-Jun-11	26,700	27	2	
Yampa	Maybell	9-Jun-11	19,600	97	2	
Green	Jensen	11-Jun-11	31,300	66	4	
Duchesne	Randlett	1-Jul-11	9,440	69	4	3
Colorado	Stateline	9-Jun-11	46,800	60	6	
Colorado	Cameo	8-Jun-11	29,200	79	9	
White	Watson	9-Jun-11	4,980	82	10	17
Price	Woodside	1-Jun-11	879	57	14	43
Green	Green River	14-Jun-11	43,700	108	15	
Gunnison	Grand Junction	8-Jun-11	14,600	103	38	
San Juan	Bluff	7-Jul-11	2,050	65	65	23

Wet Base flows Aug thru Oct (cfs) Targets 2011

Colorado River at Palisade	1630	2143
Green River at Jensen	2800 to 3000	3471
Yampa River at Maybell	134	635
Duchesne River at Randlett	min = 115	740
Gunnison River at Grand Junction	1200	2070
White River at Watson	600	609

COLORADO RIVER ACTION PLAN: GUNNISON RIVER

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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, but filed February 27, 2012; final ROD anticipated soon.
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

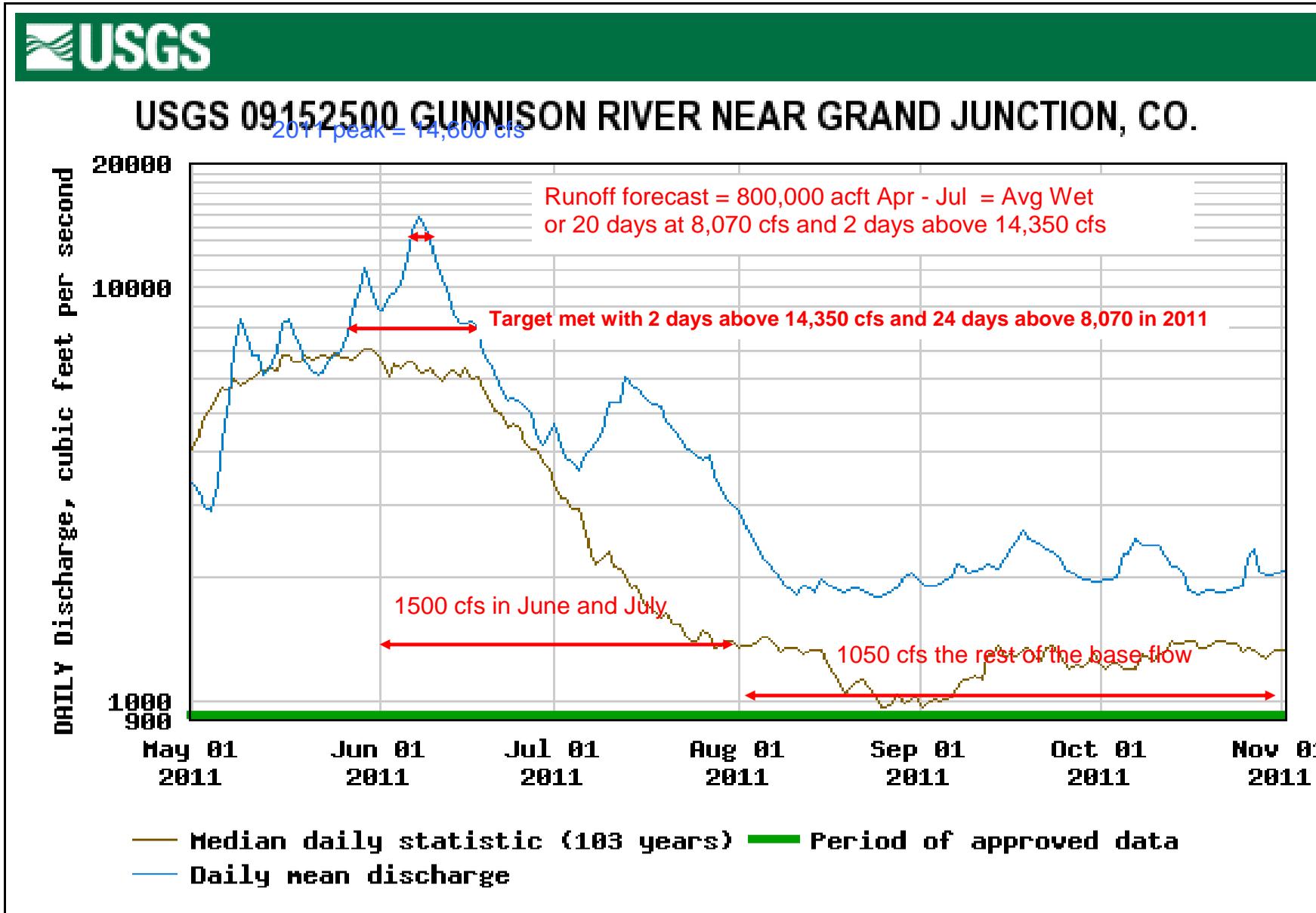
	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
I.D.	Evaluate and revise as needed flow regimes to benefit endangered 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	In October of 2011 the Recovery Program approved the USGS sediment report on the Gunnison River in Colorado and the Green and Duchesne Rivers in Utah (FR-Sed Mon); it is in the USGS print process and the title is still draft. (See related discussion General I.A.4.b)
I.D.1.	Develop study plan to evaluate flow recommendations / evaluate Selenium Management Program.	FWS/BOR/WAPA	Complete							! Aspinall Study Plan completed in 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.	Program	New start	X	X	X				See General, I.A.4.b.
I.D.1.a.(2)	Collect aerial photography during the peak flows to determine area of floodplain inundation at Escalante SWA and other sites.	Program	Pending		X					Aerial photography collected during peak flows in 2011; see comment on General table.
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.	BR	Pending		X					
I.D.1.a.(4)	Repeat depth-to-embeddedness (DTE) surveys in the Escalante area.	BR	New start				X			
I.D.1.a.(5)	Evaluate the effect of operations to meet the Proposed Action on the Gunnison River thermal regime.	BR	New start					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.	CPW/FWS	Ongoing	X	X	X	X	X	X	! Project 163 initiated - comprised of multi-life stage fish community monitoring on the Gunnison River mainstem and in the 18-mile Reach of the Colorado River. This Recovery Program project is complemented by CPW's ongoing 3-Species sampling in the Gunnison River. N73
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)).	CPW/FWS	Ongoing	X	X	X	X	X	X	Muscle plugs were collected again in 2011 from endangered fish 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	X	
I.D.2.	Integrate and synthesize information to evaluate and recommend necessary revision of the proposed action	Program	New start					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 (Unawep Charolais Ranch) (98.7) was completed October 2003. Levee removal completed and operation,
>* II.A.2.b.	Construction (levee removal)	BR	Complete							maintenance and evaluation of sites incorporated into Colorado River Subbasin Floodplain Management Plan (Valdez and Nelson 2004b) (IIA4).
II.A.2.c.	Operate and maintain.	BR/FWS	Complete							
II.A.2.d.	Evaluation.	FWS	Complete							
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.									

COLORADO RIVER ACTION PLAN: GUNNISON RIVER

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
	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).						
>*	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. 8,705 fish used the ladder in 2011; of those 7,087 were native fishes, including 2 pikeminnow and one stocked razorback sucker and 0 humpback chub, and 7 bonytail. One hundred and ten pikeminnow, 28 razorback sucker, 8 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	Fish screen operated for 107 days (59%) was off for 73 days (41%). Highflows brought debris and sediment, increasing number of days fish screen was not operated.
	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 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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 worked with Painted Sky Resource Conservation and Development Council to construct Hartland Diversion Dam fish passage (completed March 2012).
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 CPW's Gunnison River Aquatic Management Plan.	CPW	Ongoing	X	X	X	X	X	X	
	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	CPW installed a fish screen on Juniata Reservoir which drains into a tributary to the Gunnison. Recovery Program requests update on how screen is functioning. The intent of the Stocking Procedures is that screens be applied to control escapement of fishes that are compatible with endangered fish recovery. Northern pike and smallmouth bass remain of extreme concern due to their demonstrated invasive potential in UCRB rivers and their potential to establish invasive populations of these species. The high density <i>northern pike</i> source population in Crawford Reservoir remains of extreme concern due to its invasive potential. Every effort should be made to ensure that the Gunnison River remains a native fish stronghold. 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.	CPW/FWS	On hold							
	IV.A.2.c. Evaluate stocking success as identified in monitoring plan for stocked fish.	FWS/CPW	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.	CPW/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	X	X	X	X	X	X	See I.D.1.b.(1), above.



COLORADO RIVER ACTION PLAN: DOLORES RIVER

	ACTIVITY	WHO	STATUS	FY 12 10/11-9/12	FY 13 10/12-9/13	FY 14 10/13-9/14	FY 15 10/14-9/15	FY 16 10/15-9/16	OUT- YEARS	Assessment of significant accomplishments (!) and shortcomings (X), (Focused on February 1, 2011 - January 31, 2012)
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.						X Establishment of smallmouth bass in the Dolores River raises concern that it may become an additional source for this invasive species in the Colorado River. Walleye also may be escaping the reservoir. The Nonnative Fish Subcommittee needs to discuss response options (and propose action item(s) to be added to the RIPRAP in 2013).
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							UDWR does not have plans to conduct additional surveys at this time due to reduction in funding from ESMF. CPW may conduct surveys higher up in the Dolores and San Miguel that could shed light on use by 3-species or endangered fish.

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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.