



# Upper Colorado River Endangered Fish Recovery Program

Summary Dated: March 7, 2014

CR/FY-13 UCRRIC  
Mail Stop 65115

## Memorandum

To: Implementation Committee  
Management Committee, Consultants, and Interested Parties  
Webinar Attendees

From: Director, Upper Colorado River Recovery Implementation Program

Subject: Draft March 6, 2014, Recovery Implementation Committee Webinar Summary

Attached are the draft action and assignment summary and the general summary from the March 6, 2014, Implementation Committee webinar.

Attachment

- Summary -  
Actions and Assignments  
Recovery Implementation Committee Webinar –March 6, 2014

**ACTIONS:**

1. Approved the September 23, 2013, conference call summary as revised.
2. Delegated approval of RIPRAP revisions/assessment to the Management Committee.
3. Agreed to meet again by conference call/webinar within the next 2-3 weeks and in person in September.

**ASSIGNMENTS:**

1. Angela Kantola will finalize the revised September 23, 2013, webinar/conference call summary and have it posted to the Program's website. *Done.*
2. The Program Director's office will conduct a Doodle poll to schedule a follow-up conference call/webinar within 2-3 weeks to discuss the multi-species recovery plan proposal and energy development letter as well as an in-person meeting in Denver near DIA in September.

**MEETING SUMMARY:**

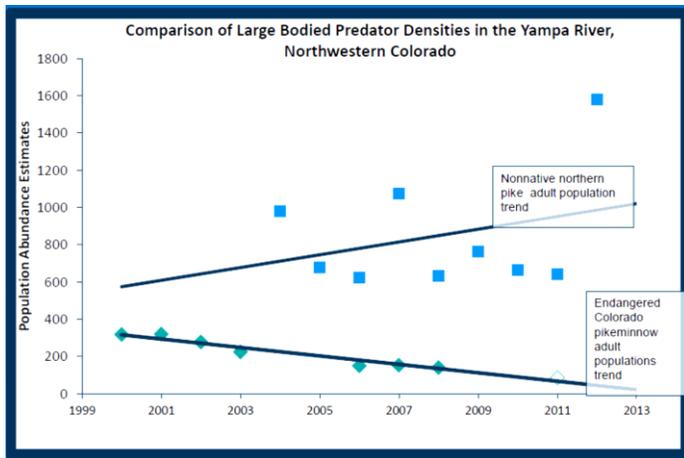
**CONVENE: 1:00 p.m.**

1. Roll call, review/modify agenda – Pat Tyrrell said Greg Lanning has left Wyoming's State Engineer's Office and so Pat has returned to the Implementation Committee for the time being. Tom Chart mentioned that Bart Miller has replaced Dan Luecke on the Implementation Committee and thanked Dan for all his work on the Committee over the years. Tom Chart noted John Shields' retirement and departure from the Management Committee. The State of Utah has brought Henry Maddux back to the Recovery Program as their representative, Henry is willing to serve as the Management Committee chair, and all the partners who have responded have endorsed this. Lynn Jeka said Western also wholeheartedly supports Henry as chair.
2. (Action Item) Approve September 23, 2013 webinar/call summary – Angela Kantola posted the draft summary to the fws-coloriver listserv on September 26, 2013. A revised draft with changes from Tom Pitts and Ted Kowalski incorporated was attached to the e-mail with the agenda for this meeting. The Committee approved the summary as revised.  
>Angela Kantola will finalize the summary and have it posted to the Program's website (*done*).
3. Program Director's update – Tom Chart provided an overview of recent Program activities. Highlights included.

- Summary of Section 7 consultations under the Recovery Program: 2,049 projects depleting up to 2,516,849 acre-feet of water from the Program’s inception in 1988 through December 31, 2013.
- Shifts in annual Program spending among Recovery Program elements over the last decade:

Recovery Element	Annual Spending 2001	Annual Spending 2014
Habitat Flow Management	21%	9%
Habitat Development	7%	15%
Nonnative Fish Management	13%	32%
Stocking Endangered Fish	33%	24%
Research and Monitoring	25%	20%

- Review of the Program’s instream flow targets, and progress and challenges in meeting those targets. Reservoir releases continue to improve flows to meet flow targets, though monthly flow averages were below dry-year targets in the White River (draft flow recommendations) and in the Colorado River at Palisade in 2013. The monthly averages mask daily drops in flows, which occurred at the Palisade gage (15-MR) in July. This was primarily blamed on a forecasted summer storm system that did not materialize. An unusually low-flow situation also developed in April 2013 in the Colorado River near Grand Junction (“April Hole”). Tom Pitts said the water users are taking the “April Hole” situation very seriously and have convened a group to discuss and make recommendations try to avoid that problem in the future. They hope to have a strategy in place by April this year. Ted Kowalski said CWCB also is working on this as it relates to their instream flow right.
- Successful larval Trigger Study Plan implementation and operation of the Stewart Lake wetland in 2013. UDWR released 592 wild produced razorback (up to 3” in length) back to the river after a 2-month inundation period.
- Orchard Mesa Irrigation District (OMID) irrigation efficiency project construction is underway with 33 check structures (Phase 1) to be in place prior to the 2014 irrigation season. The project as a whole is anticipated to save  $\geq 17,000$  acre-feet of water/year in the 15-Mile Reach of the Colorado River and downstream).
- Plans for screening the Tusher Wash Diversion irrigation canal to prevent endangered fish entrainment.
- Shifts in propagation activities to produce larger (but fewer) razorback sucker and more and larger bonytail.
- Successes in razorback sucker stocking and reproduction (with overwinter survival of wild-produced juvenile [age-1 and age-2] documented in 2013, a big step toward demonstrating a self-sustaining population).
- Colorado pikeminnow population status in the Colorado River (relatively stable) and Green River (recent declines) subbasins. Declines in the Yampa River have spread to the Green River system as a whole. Numbers of northern pike have been increasing while Colorado pikeminnow have been decreasing in the Yampa River. The Colorado Pikeminnow Recovery Team recommended that the Service defer discussions about downlisting Colorado pikeminnow in light of this trend.



- Stationary PIT (passive integrated transponder) antennas throughout the basin are gathering a great deal of data and have raised questions of how to manage the large volume of data, whether endangered fish are avoiding our sampling methodologies, and where else we should deploy PIT antennas. Bureau of Reclamation has released an FOA (funding Opportunity announcement) to update and improve our (Upper Colorado and San Juan Programs) database.
  - Nonnative fish control activities (emphasis on smallmouth bass, northern pike, and walleye).
  - Completion of the *Upper Colorado River basin Nonnative and Invasive Aquatic Species Prevention and Control Strategy* which promotes
    - A basinwide perspective, recognizing that several of the “worst-of-the-worst” species don’t belong anywhere in the Upper Basin and manage accordingly
    - Reducing illegal introductions
    - Focusing control on known sources
    - Experimenting with innovative techniques
    - Conserving native species strongholds (e.g., Gunnison and White rivers)
    - Utah and Wyoming’s expansion of must-kill regulations
    - Colorado treatment of Miramonte Reservoir
    - Utah’s containment plan for walleye in Starvation Reservoir
    - Colorado development of Elkhead Reservoir strategy
    - Expansion of efforts to control northern pike in the upper Yampa River
    - Colorado’s rapid response to smallmouth bass invasion of Ridgway Reservoir
    - Colorado’s screening of Rifle Gap Reservoir
    - Program’s rapid response to walleye invasion
4. Recovery plans update – Tom Pitts reviewed history of water user involvement in the Recovery Program, Program expenditures, funding legislation and Congressional outreach. Last year, the non-Federal Program participants had to relay to Congress the 5-year delay in downlisting Colorado pikeminnow, which was not well received by several members of the Congressional delegation. Tom outlined his July 2013 proposal to the Service to expedite development of recovery goals for all four species and to expand and diversify recovery team membership. The Service declined to expand the Colorado pikeminnow team and said they would develop the four species plans sequentially. Water users remain concerned about how long this will take and so have worked with other Program participants to develop an alternative proposal for a multi-species approach for the humpback chub,

razorback sucker, and bonytail (sent to the Committee on March 4) in order to expedite development and help assure continued Congressional and grassroots support of the Recovery Program. Pat Tyrrell said he appreciates the efficiency this might bring, but would like to hear the downsides of this approach. Noreen thanked Tom Pitts and the others who developed the proposal and apologized that she's only had a few days to consider it. Noreen said her overriding goal is to continue to show progress, achieve recovery, and provide certainty for water users. The question is how to best get there and how to best balance between time invested in recovery planning and implementing on-the-ground recovery activities. Noreen committed to considering how we can achieve as much efficiency as possible where a multi-species approach may make sense with species with strong overlap, but the Service will need some time to consider how this can best be achieved. Tom Chart said the draft revised Colorado pikeminnow recovery plan will go to the Service for internal review within the next couple of weeks. Tom thinks the multi-species approach has merit, but thinks a standalone Colorado pikeminnow plan makes sense. Razorback sucker and bonytail plans might be combined, but humpback chub may not fit well into a multi-species plan. Tom Chart expressed concerns about building a larger recovery team in terms of efficiency. Expanded stakeholder involvement is already built in to the review process following internal Service review. Tom Chart recommended the Management Committee dig a little deeper into these discussions. Leslie James said some of CREDA's concerns echo those Tom Pitts has described and CREDA also has a strong interest in the humpback chub plan in light of their involvement in the lower basin. Stakeholders want to have the goals clearly identified quickly to best direct management activities and would like to see recovery teams expanded with appropriate expertise. Leslie believes Tom Pitts' proposal has real merit and can't underscore enough the questions Congress asks about the Program's progress. Noreen affirmed the importance of maintaining strong Congressional support and agreed that the status of the fish is the central issue. Lynn Jeka said she thinks Tom's proposal would help expedite development of the recovery plans and endorses expansion of the recovery teams (e.g., with biologist Shane Capron of Western's staff). Ted Kowalski said Colorado has been discussing the water users' proposal, also, and supports any efficiency that can be found. With regard to expanding the recovery team(s), Colorado would want to make sure it was to bring needed biological expertise to the table. Leslie clarified it's Western's biologist that CREDA would like to see added to the team(s). Tom Chart said that each team would have a different group of species and technical experts, i.e., the humpback chub team would be a different group than the Colorado pikeminnow team. Tom Pitts said from a practical standpoint, water users are concerned that the recovery plans will take so long to develop that we will have reached downlisting dates before the plans are revised. Noreen Walsh recommended giving Program participants a couple of weeks to consider the proposal. Mark Sturm and Bart Miller said they would like that opportunity. Tom Pitts said the water users also are amenable to other proposals that would address their concerns. Noreen suggested the Committee gather by conference call or take an e-mail vote on this proposal in a couple of weeks. >The Program Director's Office will send out a doodle poll to hold another call to act on the proposal within two weeks to a month.

5. Update on developing a Program position on the oil and gas impacts in the floodplain – Tom Chart said his office would like to capitalize on the influence of the Recovery Program with regard to energy development impacts to endangered fish habitat. Tom said the Service consulted on a project this summer with potential drilling very close to Ouray National Fish

Hatchery and subsequently asked the Program if they'd be willing to address these issues more broadly. In response, the Management Committee has been considering a letter to the States' oil & gas divisions about energy development near key endangered fish areas. The Program Director's office provided a revised draft letter prior to the Management Committee's February 11 meeting. From the Management Committee's February 11 discussion:

“The Program Director's office hopes to get simultaneous review of this latest draft from the Committee and the Service. Tom Chart asked for comments back on the draft letter by February 28. Kevin also asked that State Committee representatives reach out to the intended State recipients of the letter and give them a heads up. Robert King said they met with John Baza this past October. John Shields suggested making the request to attend a meeting more clear up front in the letter (and still reiterate it toward the end). Kevin McAbee said the Service recently worked with EPA and DOJ on Clean Water Act violations related to improper drilling in one of the Program's floodplain easements near Pariette Draw (Lamb Property). The case has been settled; Gasco agreed to plug & abandon the well, restore the floodplain, and pay damages. EPA had solicited expert witnesses in preparation for trial; Kevin Bestgen provided expertise on fish biology/ecology and outlined the risk to the endangered fishes of oil and gas activities within the 100-year floodplain. Andrew Gilmore asked about how/if we might want to publicize this case to educate folks about risks and procedures. Kevin McAbee indicated that EPA had asked for our input on a distribution list.”

Tom Pitts submitted a few comments on the letter today. Tom Chart said we would seek Implementation Committee of a final draft and then it would be signed by Noreen. Tom Chart outlined a related issue of pipeline crossings. The Service makes sure pipelines that cross critical habitat and floodplains have shutoff valves, but we may want this letter to also address pipeline shutoff valves where there is no federal nexus. Tom Chart added we also might want to mention that we don't want to push development into other species' habitats of concern. The letter recommends inviting the States' oil and gas directors or staff to a Management Committee to discuss these issues. Bart Miller said he thinks this is an important issue and it makes sense to try to get out in front of potential impacts/conflicts. Tom Pitts said he supports a letter from the Committee to the States' oil and gas directors, but suggested it might be more productive to invite them to meet with Program/Service staff and then report back to the Implementation or Management committees. Tom Chart thought that was reasonable. Noreen suggested incorporating the recommended changes to the letter, sending out a new draft, and taking this up again in the Implementation Committee's call in 2-3 weeks; the Committee agreed.

6. April Washington, D.C., briefing trip – Tom Pitts said John Shields put together a draft itinerary, which Tom very much appreciates. John has done tremendous work on this trip in the past and Tom Pitts and others are working to pick that up this year following John's retirement. The trip will be April 8-11 to meet with Congressional delegation, committees, Reclamation leadership, etc. (Service leadership will not be available that week because they'll be in their annual Directorate meeting; Tom said they may try to set up a conference call with Service leadership in the future and Noreen said the Region would be happy to help with that). Tom also will contact Melissa Trammell about setting up a meeting with National Park Service leadership during the trip. Tom said trip participants will support the

President's budget as released March 4 and will once again be gathering letters of support in that regard. Tom emphasized the importance of briefing Congress annually to demonstrate the grassroots support for the Program by non-Federal parties and to update Congress on the Program's progress.

Noreen expressed the Service's appreciation for John Shields' many years of leadership working with Congress and chairing the Management Committee. Noreen said she understands Colorado previously chaired the Committee, expressed the Service's appreciation for Utah's willingness pick up the baton, and have Henry Maddux serve as chair.

7. Sufficient progress

- a. Review of 2013 sufficient progress items – Tom Chart highlighted several items (shown in Attachment 2).
  - b. Update on 2014 sufficient progress schedule and strategic communications plan – Angela Kantola said the Service considers the Program's assessment of progress under the RIPRAP as the Service reviews "sufficient progress" each spring, according to the following general schedule:
    - ~March 31: RIPRAP assessment is completed and approved by the Program.
    - ~April 15: Program Director's office distributes a draft of the sufficient progress memo (with final RIPRAP assessment attached) and a draft strategic communications plan to the Service and Management Committee. The draft elements of the sufficient progress memo include: a) a population status update; b) a list of accomplishments and shortcomings; and c) discussion and recommended action items. Also included in even years is a review of action items in the Yampa PBO.
    - ~April 30: Management Committee web conference to review and comment on the draft elements of the sufficient progress memo.
    - ~May 7: Service web conference to review and comment on the draft elements of the sufficient progress memo. The Service considers the Management Committee comments during the review.
    - ~May 15: Program Director's office prepares final draft sufficient progress memo/determination for Service review.
    - ~May 30: Service sends Management Committee the final draft sufficient progress memo primarily for informational purposes. The Management Committee will notify the Service if members have any significant issues/concerns.
    - ~June 15: Service finalizes sufficient progress memo.
8. (Action Item) Review and approval of RIPRAP revisions/assessment – In keeping with past practice and to maintain the schedule for the Service's sufficient progress determination, the Management Committee recommends that the Implementation Committee delegate review and approval of RIPRAP revisions/assessment to the Management Committee (meeting via webinar on March 20). The Committee delegated this review and approval to the Management Committee.

9. Southern Rockies LCC update– Tom Chart mentioned that the SRLCC is joint-led by Reclamation and the Service. The SRLCC recently finalized their resource priorities, with native fish and streamflow considered among the top five, along with cultural resources, mule deer & elk, and sage grouse. Noreen’s Deputy Matt Hogan is on the SRLCC Steering Committee and Tom Chart plans to review Program activities with him prior to the next Steering Committee meeting. Recently funded SRLCC projects include one being conducted by The Nature Conservancy on the importance of tributary junctions along the Colorado and Dolores rivers. Noreen said the impetus behind LCC’s is to bring together various groups and agencies within a geographic area to discuss shared goals and then bring together science they can use to achieve their shared conservation goals. The Service will be looking for areas where the Program and the SRLCC can collaborate. The Colorado River Basin Study environmental flows group may help coalesce disparate interests to fill data gaps or provide information via the SRLCC.
10. Regional Director’s 2014 Program priorities – Noreen Walsh reviewed the [Region’s FY14 priorities](#) as they relate to the Upper Colorado River Endangered Fish Recovery Program. The Service has been increasingly intentional in identifying and committing to specific priorities.

Colorado River Endangered Fish Recovery Fiscal Year 2014 Action Items include:

- Finalize a basin-wide aquatic invasive species control strategy that provides a sustainable approach to managing threats of predation and competition to the endangered Colorado River fish. *Final approved by Management Committee February 11, 2014.*
- Publish a draft Colorado Pikeminnow Recovery Plan. *Draft to Service for review anticipated mid-March with a 45-day (or less) review period.*
- Convene a Recovery Team to begin revision of the Humpback Chub Recovery Plan. *Should begin work on this in April or May, but will first discuss the multi-species approach.*
- Revise and finalize the Recovery Program’s Integrated Stocking Plan with the intent of improving survival of hatchery-reared bonytail. *Will be completed this year.*

Noreen said she is always interested in how partners may want to provide input or collaborate on these Regional priorities.

11. (Action Item) Schedule September 2014 Implementation Committee meeting and identify agenda items – Noreen asked if the Committee would like to have a face-to-face meeting (near DIA in a time-frame that allows flying in and out the same day), as it’s been several years since they’ve done so. Committee members expressed support for such a meeting. >The Program Director’s office will send out a doodle poll to find a suitable time during the week of September 15 or September 29.

**ADJOURN: 3:10 p.m.**

## Attachment 1 - Participants

### IMPLEMENTATION COMMITTEE MEMBERS:

Noreen Walsh, U.S. Fish and Wildlife Service (Chair)  
Ed Warner, U.S. Bureau of Reclamation  
Mark Sturm, National Park Service  
Bart Miller, Environmental Groups  
Leslie James, Colorado River Energy Distributors Association  
Pat Tyrrell, Wyoming State Engineer's Office  
Ted Kowalski, Colorado Water Conservation Board  
Lynn Jeka, Western Area Power Administration  
Tom Pitts, Upper Basin Water Users  
Mike Styler, Utah Department of Natural Resources  
Program Director Tom Chart, U.S. Fish and Wildlife Service (nonvoting)

### OTHERS:

Henry Maddux, State of Utah  
Eric Millis, Utah Division of Water Resources  
Steve Wolff, Wyoming State Engineers Office  
Brent Uilenberg, U.S. Bureau of Reclamation  
Robert King, State of Utah  
Tom Czapla, U. S. Fish and Wildlife Service, Recovery Program  
Angela Kantola, U. S. Fish and Wildlife Service, Recovery Program  
Melissa Trammell, National Park Service  
Clayton Palmer, Western Area Power Administration  
Bridget Fahey, U. S. Fish and Wildlife Service

## Attachment 2

Action Items from the [2013 Sufficient Progress Memo](#)

March 3, 2013

#	Recommended Action Items	Lead	Due Date	Status
<b>General – Upper Basin-wide</b>				
1	Swiftly complete & fully implement an effective, comprehensive <i>Upper Colorado River Basin Nonnative and Invasive Aquatic Species Prevention and Control Strategy</i> .	PDO, States	2013	MC approved 2/11/14.
2	Develop RIRPRAP addendum identifying a subset of specific, tangible actions from the Basinwide Strategy to be accomplished in the next 3 years, including: increased control efforts directed to sources of nonnative predators; adequate rapid response to recent and future “outbreaks”; and a strong outreach campaign that sends the message to the public that only nonnative fisheries that are compatible with endangered species recovery are acceptable.	PDO, States	2013	Addendum approved by States and accepted by USFWS; progress to achieve actions being tracked at Biology and Management committee meetings.
3	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. If funds available, Program may develop a 2014 SOW to investigate age-0 and age-1 humpback chub mortality.	Program		CSU's recent robust population estimate analysis more clearly indicates that declines in the Westwater and and Black Rock humpback chub populations are due to lapses in recruitment, i.e. adult survival rates have remained stable. PI's agree that reinitiating an Age-0 monitoring component is advisable.
4	200 age-0 <i>Gila</i> will be brought into captivity from Black Rocks/Westwater when conditions allow.	FWS	2013 2014	Flow conditions inadequate again in 2013; will try again in 2014.
5	A currently funded study at CSU combining Westwater and Black Rocks data sets and exploring alternative population models may shed some light on this issue from a stock assessment perspective.	CSU	2014	Initial results of combined WW/BR report provided during Bestgen presentation on 10/10/13 BC webinar; appropriate portions to be included in individual Black Rocks and Westwater reports.
6	Support research to determine dose response information (for selenium and other forms of contamination, e.g. petrochemicals, heavy metals, and endocrine disruptors) related specifically to the endangered Colorado River fish as well as necessary remediation.	Program	Ongoing	
<b>Green River</b>				
7	Closely coordinate Tusher Wash e-barrier (or other barrier) construction with NRCS's rebuild of the Tusher diversion structure.	PDO, USBR	2014	Construction tentatively scheduled to begin fall 2014, but realistic timeframes still being developed. Alternative presented to BC in January 2014 to provide an electrified weir wall with a fish return in the Green River Canal, downstream of the hydropower facility is being considered. PIT antennas installed March 2013 detected high level of entrainment of razorback sucker and Colorado pikeminnow; additional antenna will be installed in 2014 to further define fish movements.
8	Red Fleet Reservoir has been recommended for reclamation (rotenone) in 2014. A microchemical analysis of otoliths from	UDWR	2014	UDWR formulating plans to reclaim in 2014.

#	Recommended Action Items	Lead	Due Date	Status
	both the reservoir and the river is underway to better understand the contribution of walleye to critical habitat from this potential source population.			
<b>Yampa River</b>				
9	Complete accounting of past depletions using the StateCU model (Due date from YPBO - 1 <sup>st</sup> report July 1, 2010; 2 <sup>nd</sup> report July 1, 2015 ). The depletion accounting report will include a discussion of the need for flow protection (which would require a peak flow recommendation). The models will be updated through 2010 or 2011.	CWCB		(Also applies to Colorado River.) A contract for the irrigated acreage assessment was awarded in February 2013. Another contract still needs to be awarded to update the dataset. Colorado has given high priority to the Yampa and Colorado river basins portion of this work.
10	Complete <a href="#">programmatic synthesis of smallmouth bass removal efforts</a> , providing a comprehensive evaluation of the Program's removal efforts (draft reports due June 15 [Part 2] and August 15 [Part 3]). The Recovery Program will review the final report on escapement from Elkhead Reservoir (Part 1, completed May 1, 2013) and determine appropriate adaptive-management response.	CSU		Part 1 of 3-part report completed; Parts 2 & 3 in review; projection tool being rolled out. See also Basinwide Strategy (item #1).
11	Conduct a <a href="#">programmatic synthesis of northern pike removal efforts</a> (2011-2012) to evaluate current removal efforts in the context of northern pike life history throughout the Yampa River drainage.	CSU		Report due to PDO 3/1/14 (final to BC 6/15/14). See also Basinwide Strategy (item #1).
12	The Program office will work with CPW to determine if any of the pike management actions identified in CPW's 2010 Yampa River Basin Aquatic Wildlife Management Plan management actions are not being adequately addressed and seek necessary remedies.	PDO, CPW		CPW provided initial assessment 5/1/13; PDO returned comments 5/17/13; discussion pending. See also Basinwide Strategy (item #1).
<b>Duchesne River</b>				
13	Rely on findings of project # C18/19 to determine how to proceed with regard to currently unknown contribution of smallmouth bass or walleye produced in the Duchesne River below Starvation and entering Green River (Ute Tribe apparently not currently conducting nonnative fish removal.)			C-18/19 report peer reviews completed; BC reviewed and returned for minor revisions in Jan. 2014; final draft to BC 2/26. See also Basinwide Strategy (item #1).
<b>White River</b>				
14	Finalize flow recommendations as part of White River Management Plan.	PDO, FWS, UDWR	Winter 2014	Per White River Management Plan schedule: develop flow recs Fall 2013-Winter 2014; complete Program review Spring/Summer 2014; finalize management plan and flow recommendations Summer 2014.
<b>Colorado River</b>				
15	Explore opportunities to continue delivering Ruedi water (or a portion thereof) to replace the release of 10,825 acre-feet of Ruedi Reservoir water that concluded in 2012.	FWS, USBR, CRWCD		
16	Complete CFOPS Phase III report.	Water Users		Draft expected by March 31 and final by June 1.
17	HUP call participants will continue to discuss screen operation with the goal of more frequent operation at the GVIC canal (recognized as the oldest and most problematic design). The	PDO, USBR, screen operators		USBR and OMID investigating mechanisms to operate GVIC Obermyer gate at lower flows.

#	Recommended Action Items	Lead	Due Date	Status
	Program will continue to evaluate ways to improve screening operations and methods, and the Program will continue to fund salvage operations of fish remaining in the canals at the end of the irrigation season.			
<b>Gunnison River</b>				
18	Mechanically remove northern pike from Crawford Reservoir.	CPW		Beginning in 2014

