

March 1-2, 2011 Biology Committee Draft Summary
[Clarion Inn](#), Grand Junction, CO, 2011

Biology Committee: Melissa Trammell, Dave Speas, Dale Ryden, Pete Cavalli, Krissy Wilson, Shane Capron, Tom Pitts, Brandon Albrecht, and Harry Crockett. CREDA was not represented.

Other participants: Dean Riggs, Pat Martinez, Tom Chart, Tom Czaplá, Angela Kantola, Travis Francis, Dave Schnoor, and Tom Nesler. By phone (Tuesday): Mike Roberts, Kirk LaGory, Kevin McAbee, Paul Abate, Kevin Bestgen, and Amy Defreese

Assignments are indicated by “>” and at the end of the document.

Tuesday, March 1

CONVENE: 1:00 p.m.

1. Nonnative fish management activities

- a. Overview of final white paper – Pat Martinez reviewed the white paper (attachment #3 in the [February 16, 2011, Management Committee summary](#)), which recommended ceasing translocation of smallmouth bass to Elkhead Reservoir, ceasing the marking pass for northern pike in the Yampa River buffer zone, ending the requirement to move largemouth bass to Highline Reservoir, and ceasing translocation of pike in the Yampa River. These recommendations were discussed by the Service and CDOW and subsequently by the Management Committee. CDOW agreed to the first three recommendations, but Yampa River northern pike will continue to be translocated to Kyle’s pond (except during raft work during the extended surge). The I&E Committee began discussing public relations regarding these changes last week.
- b. Discussion of northern pike synthesis – Pat said CDOW has a strong interest in seeing a synthesis for pike similar to the one the Program is conducting for smallmouth bass. The most efficient way to accomplish this would likely be to add it to the smallmouth bass synthesis scope. Kevin Bestgen has suggested the synthesis could include four elements: 1) organizing the database; 2) producing revised abundance estimates over time; 3) understanding the size of recruitment year-classes and immigration in relation to hydrologic conditions or spawning habitat availability; and 4) understanding pike impacts on Yampa River fishes is to employ existing bioenergetics models using real or hypothetical abundance levels and various population size structures. Koreen Zelasko likely would perform the analysis, with assistance from Gary White. Kevin has estimated the cost at \$130K-\$170K over two years. A bioenergetics model is already available. Harry asked if this would allow manipulating exploitation rates and tying those to predation demand; Kevin said it would. Harry said CDOW likes the idea that we’ll be able to run these models ourselves, and down the road, tie them to endangered fish response. Kevin agrees this is a good approach and believes we’re collecting the data necessary to do that.

Pat said the bioenergetics model should be able to accurately predict biomass consumed (though perhaps not numbers of individual species). Kevin noted that the data we have on pike bite marks on pikeminnow also can be incorporated. Although they recognize that the Program budget is tight, CDOW would like to see this work begin as soon as possible. Kevin confirmed that beginning the pike synthesis would not delay the smallmouth bass synthesis. With regard to endangered fish response, Kevin said they're about to embark on the third population estimate for Colorado pikeminnow in the Green River basin, and so should be able to show if pikeminnow are responding (though not necessarily specifically to nonnative fish control). Tom Chart clarified that the syntheses first and foremost evaluate the success of nonnative fish removal. Dave Speas agreed, but would like to know more about the proposed food web and bioenergetics objectives and where those will take us. With regard to tying nonnative fish management actions to endangered fish response, Tom Pitts questioned whether this can really be quantified, and thus, whether we can really satisfy what CDOW wants. Tom added that if water users had required demonstrating fish response specifically to water management activities, we wouldn't be very far down the road at this point. Harry noted the Program is already in the middle of a large nonnative fish control effort, and agreed that we may not be able to show direct cause and effect, but CDOW would like a model that can predict the outcome of nonnative fish exploitation rates. Shane suggested that an energetics model can serve as a risk assessment to help show potential "red zones" of exploitation. Dave suggested waiting to see what we learn from the smallmouth bass synthesis before getting too far into a pike synthesis. Brandon agreed that a structured model to help guide our decisions would be useful, but also thought it would be good to first see results of the smallmouth synthesis and a more detailed proposal from Kevin outlining expected results. Tom Chart said northern pike analysis may be more straightforward and so we might not need to wait for the smallmouth synthesis. If we have to make choices in what to fund, it may make sense to focus on this kind of synthesis (details, e.g., bioenergetics, notwithstanding) to evaluate the effectiveness of our current approach and cut back on active work in the river if needed. >Kevin Bestgen will work with Pat and Tom Chart to flesh out the proposal for the Committee's consideration.

- c. General discussion of modeling and structured decision-making (SDM) – Harry said the discussion at the AFS meeting last week related primarily to SDM and he's not entirely sure how that will apply in the Recovery Program. He had hoped to learn more about an adaptive management process (e.g., what the Service uses to set waterfowl harvest quotas). Harry is looking for more quantification of expected outcomes to guide actions and an ability to compare predicted vs. actual outcomes. Pat said it's been suggested that SDM and/or a more formal adaptive management process may be helpful to the Recovery Program. Pat believes we already have considerable rigor in things like our recovery goals, with intensive review and monitoring to see how we are achieving those, and in subsequently adjusting recovery actions as we compare results with goals. Thus, Pat said he thinks the Program's existing methods generally cover an adaptive management strategy. Several examples of SDM provided at AFS appeared to take a great deal of effort to get off the ground and many issues were left unresolved. CDOW will try SDM with a much smaller set of questions at Blue Mesa Reservoir and then will have a better idea of

how it might apply elsewhere. At this point, Pat is not convinced that this approach will be a significant improvement over our current process. Shane said SDM has worked well in the GCDAMP on nonnative fish, helping to get all the values on the table and then determining the direction to take. It involves six basic steps that are pretty straightforward, and which don't have to be very complicated. Shane thinks it could help us decide what to do over the next five years, for example. Pat mentioned an AFS review of the adaptive management system on the Snake River is not very encouraging. Dave Speas suggested these efforts are more likely to be successful as they are more narrowly-focused. Angela suggested the Committee keep the door open for these kinds of exercises, but wait to see how results from similar efforts at Blue Mesa, Glen Canyon, etc. before committing to anything. Harry agreed, saying we'll also want to first see results from the smallmouth bass synthesis.

- d. CDOW's "bucket list" – Harry Crockett reviewed the list (Attachment 3), calling attention to the Yampa State Wildlife Area where the bank between the river and the pond is rapidly eroding (and is at some risk of blowing out at high water this year). CDOW has funds for extensive bank stabilization (of the type that won't just chase the problem downstream), but they can't access those funds until July 1 of this year. CDOW asked if the Program could provide \$30K in capital funds to temporarily stabilize the bank since a blowout would cause the cost of repairs to exceed funds CDOW will have available in July. Harry will need to check on permitting requirements. >Harry and Dave Speas will talk with Brent Uilenberg about the possibility of getting capital funds; >Harry will follow up with CDOW to make sure they could move forward with the temporary fix this year. CDOW also will look to see if other funds might be available. With regard to other items on Harry's list, Tom Chart suggested considering those after we do a northern pike synthesis.
2. Discussion of Flaming Gorge spring and base flows – Tom Chart outlined last year's and this year's (draft) request. It seems we're missing the link for what we're trying to accomplish in Reach 2 with the timing of larval razorback, so this year's draft letter (Attachment 2) is aimed at implementing the flow recommendations, but using the biological trigger of the presence of larval razorback in the system. Kevin Bestgen provided the following for the Committee's consideration: *An additional benefit of relatively high and late flows would be to disadvantage condition and survival of small smallmouth bass hatched in summer 2010. An hypothesis that prevails in the smallmouth bass literature is that small age-0 bass going into winter may be susceptible to higher overwinter mortality because their relatively small body size limits energetic reserves that may run out before spring comes (with attendant warmer water and more abundant food resources). Extending the hypothesized stressful winter-spring period with higher flows and cool water temperatures from Gorge releases may further limit bass survival in Reach 1 and 2 of the Green River. Studies are in place to document the abundance of small, just-turned age-1 smallmouth bass (hatched in summer 2010, turned age-1 on 1 January 2011) including 115, and bass removal studies, from which CPE of age-1 bass could be compared across years.* Dave Speas distributed the current hydrologic forecast, which is looking good (39% exceedance for Flaming Gorge and 17% for the Yampa). Dave said the FGTWG will have to discuss shifting to a biological trigger instead of the Yampa peak in the context of the ROD. Tom Chart noted that temperature also may help predict appearance of larvae. Shane asked about Western's comments on UDWR's proposal and Tom Chart said those were incorporated in the draft. Shane raised the question

of the goal of 18,600 cfs in light of which floodplains we're targeting and whether potentially lower flows might adequately connect those sites. Tom Chart said that although we do have some new information, he doesn't think there's anything to contradict the 18,600 cfs for the broad connections across the Ouray area. Dave said he thinks we should focus on the question of timing and the flow recommendations this year, rather than trying to simultaneously answer questions about inundation thresholds. Kevin Bestgen clarified that connecting floodplains is important, but we also need to provide opportunity for larvae to get to and enter those floodplains, and higher flows increase this opportunity for entrainment. Kirk said this may be an opportunity to look more closely at filling single-breach floodplains. 15,000 cfs provides connection and entrainment at many floodplains. The higher flows will be more difficult to achieve if there's a significant disconnect between the Yampa peak and appearance of razorback larvae. Kevin Bestgen agreed that single-breach wetlands are important, but we still need to time flows to the appearance of razorback larvae. Daily fluctuations are important for entraining larvae, but this won't happen at lower flows (e.g., 15,000 cfs vs. 18,600 cfs). Melissa said she thinks the 18,600 cfs for 2 weeks target has been well justified in the letter. Tom Chart agreed it may be a tough flow request to meet. Kevin McAbee and Paul Abate said the Service likely will view the use of the biological trigger as a valid experiment to contribute to recovery. Melissa, Brandon, Krissy, Pete, Dave, Harry, Tom Pitts and Dale all supported the draft letter. Pete asked if anyone is looking at habits of burbot in the reservoir; currently no one is doing so (we'll likely need to look into this in the future). Dave said there may be discussion from a NEPA standpoint as to whether using a biological trigger is part of the action as it was analyzed. Shane suggested we might propose a lesser flow for this experiment and see what results (conversely, Dale suggested it's more appropriate to first test the *recommended* flow). Tom Chart observed that we've detected good numbers of larvae, but not recruitment; therefore, in a year like this, he believes we need to meet the minimum flow (i.e. 18,600 cfs) and go beyond it if possible to benefit the population as a whole. Dave said he thinks the timing is more the focus of this year's request than the 18,600 cfs. The Committee approved the draft letter as written; it now goes to the Management Committee for approval (prior to March 9); >Tom Chart will do a final editorial review and seek the approval of the Management Committee via e-mail. Tom will not include the smallmouth bass information provided by Kevin Bestgen since it is still a little vague. Shane noted that it's not clear whether this year's experiment will answer the smallmouth bass question. Shane added that we haven't fully addressed potential trade-off of impacts of lower base flows on smallmouth bass. >Dale Ryden will contact Ouray NWR about coordination of this experiment and management at Ouray. Dave Speas said there will be parties that ask about our monitoring to determine the success of the experiment.

3. Price River – Tom Chart received comments on the draft Price River position paper from Dave Speas, Pete Cavalli, and Krissy Wilson. The paper is in response to an RPA from the Narrows BO to determine flow requirements of the endangered fish in the Price River. Tom outlined the history of past studies and the position paper. Tom believes he can address the comments received. Pete would like to see the analysis cleaned up a bit, even though it may not change the results. Krissy said their concern lays with the fact that pikeminnow use the system and Utah would like time to better document whether there is more pikeminnow use than shown to date. (They're not asking for funding to do that.) Utah has to recover all of their tributaries for the native species which aren't listed and it will help if they can have the support of the Program. Thus, they don't want the Program to "write off" the Price River yet, and the third recommendation in the draft paper might be interpreted that way. Tom

Chart tried to write that recommendation carefully, noting it's based only on currently available information. Krissy said that UDWR will bring any additional flow measurements from Cavalli 1999 to the Program. Amy Defreese is looking at this paper from the perspective of the biological opinion and NEPA and the Service meets with Provo Reclamation to discuss this next week. Questions remain as to whether flows could be delivered to the Woodside gage. The draft does not provide an explicit flow recommendation, but based on the information currently available, that's difficult to do. Tom Pitts agreed there may be other good reasons for restoring habitat in the Price River, but he concurs with Recommendation #3 from a Program perspective. We have not shown that the Program needs to restore habitat in every tributary to the Green River to achieve recovery. Brandon Albrecht and Dale Ryden raised the example of the new-found importance of Yellow Jacket Canyon to Colorado pikeminnow (Yellow Jacket is a tributary to a tributary which the San Juan Program had assumed was not important to recovery). The San Juan Program is beginning to take a second look at tributaries as a result. Dave Speas noted that PIT-tag readers picked up 42 endangered fish passes in the San Rafael. Tom Chart asked if flexibility could be found on the spring peak to augment base flows and keep the project whole. Krissy said we need to start working with water users now and looking for opportunities to provide water; Utah has no choice, they have to do this. Tom Pitts said if we find that more water in tributaries is needed to recover the fish, then we need to find a source of that water without taking it. Angela asked what we can say in the report based on available information that doesn't imply any intent to take water from water users, doesn't imply a flow recommendation which doesn't meet the Program standards, and doesn't hamper Utah's ongoing/future efforts to restore/protect Price River habitat for other native fishes. Amy asked if there's evidence that flows less than 30cfs at greater frequency in the past will negatively impact the endangered fish; Chart believes there is, but we may have said as much as we can, given the available information. Pete clarified that flows need to be protected to the Green River, not just to the Woodside gage. >Tom Chart will respond to comments and revise the report (in consultation with the Service) and bring it back to the Committee. Any additional comments should be provided to Tom by March 15.

4. Discussion regarding stocking fewer, larger razorback for the next few years given the decrease in grow-out ponds in the Grand Valley – Based on the current lack of pond space for the Grand Valley, the Biology Committee has asked the Grand Valley to focus on raising fewer, larger fish until the Horsethief ponds are available (2-3 years). To maximize fish size, they will feed the existing leased/free Grand Valley ponds this year and potentially treat fish for *lernea*, which may help. They *could* also transfer some Grand Valley fry to Randlett and then return them to the Grand Valley unit. Dave proposes hand-sorting fish at the ponds by visual estimate and returning too-small fish (<~280mm, because they will not actually be measured) to the ponds. Fish returned to ponds may not over-winter, but those that do could be harvested in the spring to leave plenty of room for the next year-class (but that would be an additional cost). Tom Czaplá suggested that, if possible, the Randlett unit produce all the razorback for stocking in the Green River (19,800 fish) and the Grand Valley unit produce just the 9,800 fish for the Colorado River until the Horsethief Ponds are available. The Biology Committee directed Dave to focus on size, not numbers, and not to try to harvest fish in the spring, since additional funds are not available.
5. Discussion of water source for Ouray NFH Randlett Unit (possibility of using some capital funds to purchase filters or perhaps finding a different water source) – Dave Schnoor

described the water quality and filtration system problems at the Randlett unit. Rebuilding the filtration systems costs \$10K and has to be done almost every year instead of the predicted 4 years. Dave would like to look at alternative water sources (e.g., culinary source from the Tribe that would require a pipeline, deeper well [“iffy”], under-river infiltration galleries). An infiltration gallery larger than the one that Randlett needs runs ~\$1.2M. For the time being, Dave Schnoor said they need \$60K for another set of filters and \$20K for filter media. Ouray has managed to make the system work to date, but it’s been difficult and there’s significant risk of failure (with serious ramifications for our ability to produce razorbacks there). Angela asked if Dave has approached the Service for these funds since they agreed to cover O&M for Ouray NFH (now called Ouray-Randlett unit); >Dale will do that. Melissa suggested that for the long-term, we need a feasibility study for alternative water sources for Ouray. >Dale and Dave Schnoor will write up these needs in a report and submit it to the Program via Tom Czapla. Dave said the Grand Valley unit needs an emergency generator and he’s on the lookout for a surplus unit (a new unit installed would cost ~\$44K). Another solution might be to install the necessary switches and rent a unit when and if needed. Angela asked about relative risks of power outages; >Dale and Dave will include this in their report.

6. Review of proposal to evaluate fish survival in GVP screen fish return – Travis answered questions about the scope, including fish too small to floy tag, de-scaling/mortality criteria, and accounting for other sources of mortality. Dale thought they could address the questions and concerns raised within the proposed \$18,100 budget. The project has a placeholder in the FY 11 budget and the Biology Committee tentatively approved it (pending Wednesday’s discussion of the Program’s outyear budgets). *PD’s note: after BC budget discussion, this now fits in FY11 budget.*
7. Brief review of Price-Stubb PIT tag results and data interpretation as it relates to direction of fish movement – Travis Francis said the antennas are detecting fish using the passage, moving both upstream and, interestingly, downstream. The dry-run tests indicated that directionality would still be detected with the antennas placed more closely together than originally planned, but we’re detecting directionality only 55% of the time at this point. Tom Czapla recommended running the antennas another year and re-evaluating next steps at that time. Reconfiguring the antennae likely would require major construction. Dave doesn’t expect similar problems with the Maybell Ditch antennas.
8. Clarification of information needs for Tusher Wash – Dave Speas described the modeling exercises to determine fish mortality, and the *ad hoc* group’s recommendation to determine mortality at the hydropower facility. Dave has been discussing this with Juddson Sechrist in Reclamation’s Technical Services Center, but he needs clarification on objectives. Dave distributed a list of questions from Juddson; >the *ad hoc* group will review and discuss these. Kevin McAbee has talked with the irrigators about fish passage, and recently discovered that the irrigators thought they wouldn’t have to address fish passage if they only capped the diversion with concrete. The *ad hoc* group thinks fish only pass on river left where the concrete is crumbled and broken. >As Kevin gets engineering info from the irrigators about this, he will share it with the *ad hoc* group. Kevin also will inquire more about the purpose of the 9” (at riverbank) – 20” (at center) concrete cap, to determine whether it is to benefit the existing diversion, or both the existing diversion and the proposed diversion on river left. Tom Czapla will send a Doodle request to set up an *ad hoc* group conference call within the

next 3 weeks (potentially including Juddson Sechrist). *Done.*

9. PD update on Aspinall Study Plan – Tom Chart is incorporating comments and will send out the revised version shortly. If the Biology Committee wants to discuss it, we will put it on the next agenda. If the Committee agrees via e-mail that they don't need to discuss it further, then Tom will send it on to the Management Committee for approval.
10. Disposition of Wahweap bonytail – Krissy recalled that Wahweap had to defer stocking bonytail while testing for LMBV (which came back negative). During the floodplain tour, the Committee discussed potentially stocking bonytail in floodplains (e.g., Leota). Tom Chart suggested putting some of the fish into floodplains before they might spawn (possibly at sites that may be sampled later in the year). Tom Chart suggested stocking a large percentage of the fish into the Stirrup prior to runoff. >Tom Czapla and Krissy Wilson will develop recommendations and send those to the Committee.

ADJOURN 5:45 p.m.

Wednesday, March 2

CONVENE: 8:00 a.m.

11. Implications of recent humpback chub genetic results for humpback chub captivity plan and potential propagation needs – Tom Czapla referenced the Committee's earlier discussion and indications that the fish we have in captivity at Ouray may be hybrids (samples from Mumma fish have not yet been analyzed). Dale said Tildon said the Douglas' work suggests there may be better sources of fish for a captive brood, such as Westwater (a relative near-neighbor where the population also is declining). Travis recommends bringing some fish from Black Rocks/Westwater into captivity once the Horsethief ponds are available. (Krissy cautioned about the fish health regulations that apply to bringing wild fish into captivity and the potential of compromising the facility's disease certification when bringing wild fish into captivity.) Shane suggested we consider humpback from the lower basin (though the lower basin genetic management plan recommends against it). Given the doubt about the fish we have in captivity, Dale said the Service would not want to use these fish as broodstock. Tom Czapla recommended returning the fish in captivity to the river (after the Mumma fish have been analyzed). >Melissa will talk to the Park about what they want to do with the fish at Ouray and Mumma (likely return them to the river after acclimation) if the Program does not want to keep them. Dave Speas asked if we want to know if this is a recent or ancient hybridization event; Dale said that the Service's intent is to recover pure-strain fish. Krissy noted the Service could base this on morphology rather than genetics, however. Melissa suggested assessing morphology now that the fish have matured somewhat (Travis said he's seen the fish and they don't look like humpback to him). Dave Speas recommended carefully quantifying this assessment. The Committee agreed to keep the fish in captivity for now.
12. Review draft revised RIPRAP and RIPRAP assessment and draft FY 12-13 Program Guidance (posted to fws-coloriver listserver by Angela Kantola on February 3) – After a presentation of the RIPRAP Treasure Hunt prize to Brandon Albrecht, the Committee reviewed and commented on the RIPRAP and Program Guidance materials.

- a. Draft revised RIPRAP & RIPRAP assessment (tables and text) – The Biology Committee reviewed the tables and made changes as needed. (Due to the volume of material the Biology Committee had to review/revise in the RIPRAP tables, their changes were simply incorporated in those tables and not specifically called out in the technical committees’ comments column).

> The Service will add to the contaminants annual report a review of and any recommended modifications to State and Federal hazardous materials spills emergency response programs (General, IIB3).

> The PD’s office will follow up on establishing a process to track percentages of hybrid suckers using standardized protocol for identification of hybridization at fish ladders and in monitoring reaches.

Regarding Yampa IIB 1d1, Pat recommends a strategy beyond habitat modification to reduce pike in the upper Yampa and suggested that we find ways (e.g., angler incentives) to remove double the number of pike we’re currently removing. Pat believes habitat modification will not reduce numbers quickly enough (e.g., by 2023) and angler incentives would have better results more quickly (for similar or less money).

The Committee discussed screening of Rifle Gap Reservoir. Pat said that he understands the intent to be to install the screen and monitor escapement *before* any additional species are considered for stocking. The lake management plan and species which can be stocked will be reviewed by the States and the Service per the Nonnative Fish Stocking Procedures.

RIPRAP Text

Krissy will provide a citation for the end of the White River, Section 3.4.1. *Done.*

Krissy will check on Dolores River fish surveys and provide a citation for the end of section 3.7.2. *Done.*

- b. Draft FY 12-13 Program Guidance

The Committee discussed the need for a potential new start for trophic stable isotope analyses under the nonnative fish management recovery element. Pat said he thinks this work is important to better quantify the risks of nonnative invasions. Melissa and Dave thought the work would be valuable, but not the Program’s highest priority in light of other pressing needs (e.g., northern pike synthesis, floodplain work, and more). Dave suggested this kind of work should be cost-shared, including and especially the mercury studies. The Committee agreed it’s appropriate to support other entities conducting this work, but it’s not within the Program’s ability to fund this work. This also will be incorporated in the Nonnative Fish Management Strategy.

The Committee reviewed the budget situation for FY12 and FY13, for which projections are over the amount of funds available (even assuming an equivalent of the full complement of power revenues are available in FY 12 [we should know in about a month if a temporary stopgap will be made available]).

The PD's office will check with Patty Gelatt about deferring Gunnison R monitoring until FY12 in light of the deferred EIS. *Done; the Service strongly encouraged the Program to move forward with this work in FY 11.*

Dale said the SJRIP is considering banking data for a few years instead of analyzing each year to save some funds (note: many of the SJRIP annual reports are more substantive and thus likely cost considerably more than upper basin annual reports). Angela and Tom Czapla expressed concern that this could sacrifice too much data understanding for only a little savings. Melissa suggested foregoing nonnative fish synthesis reports (however, it doesn't appear we've included additional funds for the synthesis reports, anyway). The Committee concluded that deferring annual reports likely wouldn't be helpful way to save funds in the upper basin.

The PD's office will work with Ouray NWR on reducing FY11 funds up to the amount they carried over from FY10 (\$45K). *Done; FY11 amount will be reduced.*

In light of the amounts by which we are currently over budget projections for FY 12 and FY 13, the Committee concurred with the PD's office recommendation take most nonnative fish project budgets back to FY 10 levels and reduce the number of nonnative fish removal passes in reaches outside the main nonnative fish source areas. As such, for FY 12-13 projections, they reduced by 20% from FY10 levels projects 110, 123a&b, and 126a and recommended discontinuing 126b. In addition, the Committee recognized that the pilot backwater nonnative fish removal project #158 would wrap up in 2012 (with final report funds included in the FY11 budget) and decided to defer implementation of this work beyond the pilot study at this time.

>Harry Crockett will review draft Aspinall Study Plan and ongoing CDOW Gunnison River monitoring and let PD's office know if CDOW work (or that and just a little extra) could address all or part of Aspinall Study Plan needs to monitor fish community to evaluate effect of flows. (Note: if this work needs to include larval fish monitoring, there would be significant costs for larval sample processing.)

The PD's office will explore the possibility of funding a White River Management Plan with Section 7 funds. *Done; will plan to use Section 7 funds.*

These and any additional changes to FY12-13 Program Guidance are summarized on the budget tables.

13. ~~Brief discussion of capital projects prioritization~~ – Deferred to a future meeting based on limited funds availability.
14. Final review/approval of UDWR's #138 report – Paul Badame incorporated comments and this report is now final. >The PD's office will post it to the web.

15. Review/approval of revised research framework report – Committee members will e-mail Czapla by March 24, 2011, to let him know if they believe comments have been adequately addressed to finalize the document. If comments have not been adequately addressed, we will put this on the next meeting agenda.
16. Review and approve [January 24, 2011, web conference summary](#); review previous meeting assignments (see Attachment 1) – Deferred to next meeting (summary of this meeting and the next will be “consent” items, so any items of concern will be communicated to Angela *in advance* of the meeting.).
17. Review [reports due list](#) – Deferred. Angela will send out an update (*provided with this summary*).
18. Schedule next meeting and outline agenda – The Biology Committee will have a web conference on Friday, May 13, from 8:00 a.m. to 2:00 p.m., with a break for lunch. Agenda items will include:
 - review of draft northern pike synthesis proposal (FY11 addendum to project #161);
 - review of Zelasko final report #159 (additional analysis of stocked razorback sucker survival);
 - review of revised Price River report;
 - review of research framework (*if needed*);
 - potentially 2007-2008 Black Rocks humpback chub population estimate report as well as FP-Synth/22f report; and
 - demonstration of the CWCB laserfiche website which houses Program technical reports.

The next Committee meeting will be in Denver, near DIA, July 11 – 12, beginning at 10:30 a.m. on the 11th and concluding by 3:00 p.m. on the 12th (**NOTE:** the Committee had suggested the meeting adjourn earlier on the 12th, but the PD’s office foresees that more time will be needed with the FY 12-13 work plan on the agenda).

ADJOURN 5:15 p.m

Attachment 1: Assignments
(Asterisked items also on meeting agenda)

1. The Program Director's office will work with CDOW and Aaron Webber on the potential for designing a permeable, hydrologically-stable (gravel?) berm to prevent northern pike access to the oxbow slough at RM 151 on the Yampa, and then clean it out once and for all. *10/30 CDOW has contacted the property owners of the RM 151 backwater, but hasn't been able to meet with them yet. Mark Wernke from Reclamation is willing to take a look at the property with CDOW. A fairly long berm would be required (>3,000') and we'll need to determine the best type (more permanent configurations could be very expensive). 1/15: Tom Nesler said they plan to get engineers develop specs/estimates this spring for something like a 10-year berm structure; the next step will be to find funding (perhaps as a habitat project through GOCO). This would be the first of three or four such projects. Tom Pitts suggested that if the Program provides some matching funds (annual or capital), it might improve the probability of getting GOCO money. Tom also suggested that if we have a project in the hopper, we might be able to compete for end-of-year Reclamation funds. 2/10: the PD's office considers this a high priority and will contribute funds, if available (see revised FY09 budget). 2/20: Recovery Program funds likely available; CDOW working to get engineers on the ground; Nesler considering different approaches (berm, fill the oxbow, etc.). 4/20: Tom Nesler said they've met with the landowner and Reclamation engineers will do an onsite survey as soon as the snow melts. 1/5/10: Project deferred indefinitely; Reclamation cautions that the lesson from the Butch Craig floodplain site is to be very careful before considering modifying habitats. Based on the channel dynamics in this area of the Yampa River, it would be unwise to construct an impervious dike at the mouth of this backwater. 1/14/10: The Committee discussed other options to eliminate spawning in this area; the **PD's office** will provide Mark's trip report to the BC and work with CDOW to outline options for Committee discussion at the next meeting (options could include: make the entrance too shallow for adults; a dike set back instead of right at the river; direct removal/net sets; piscicides, etc.) 2/22: PD's office provided Mark's report. 3/10: **CDOW** will work with Reclamation to flesh out their gravel proposal and review additional options (e.g., plant eradication, barriers, etc.). This will be on the May 6-7 Committee agenda. 5/6/10: Sherm Hebein said Reclamation will conduct a site visit with CDOW in July. 8/18: Sherm hopes to schedule a visit after the landowner cuts the grass in the next 2 weeks. 3/11/11: Harry Crockett provided a list of habitats CDOW would like to work on (attachment 3 to March 1-2, 2011 BC meeting summary). A rapidly eroding bank at the Yampa SWA is the highest priority, but CDOW can't access funds to stabilize it until July 1. **Harry and Dave Speas** will talk with Brent Uilenberg about the possibility of getting capital funds; **Harry** will follow up with CDOW to make sure they could move forward with the temporary fix this year. **CDOW** also will look to see if other funds might be available. Other items on the list may be considered after a synthesis of the northern pike data.*

2. Within the next month, >the **Service and Program Director's office** will provide the Committee a draft addendum to the White River report that will present the measured flow requirements in a historical hydrologic perspective. The Program Director's office also will research where we left Schmidt and Orchard's draft report on peak (channel maintenance) flows and recommend whether to have it reviewed by the geomorphology panel. The Program Director's office will use the information currently available to >develop a position paper on Price River flow recommendations for Committee review. *10/16 Pending; out by*

~~the end of November~~ 1/5: February 2009. 2/20: Bob Muth said he's making good progress on this and he'll have a draft to the Committee by ~~early March~~ end of April. 7/8: Mohrman and Chart expect to provide drafts of this and Price River report by the end of August 2009. 7/13: Dave Speas said the goal for the Narrows EIS is to get it out for public review in the fall, so the above schedule should work. The PD's office will keep the Service's SLC-ES shop in the loop on Price River. 9/21: Chart and Mohrman have made good progress on this, but other priorities have so far prevented completion. 1/14/10: still pending and the PD's office will continue to communicate with Reclamation re: Narrows. 3/3/10: PD's office is communicating with SLC-ES to determine the best way to move this position paper forward. 5/6/10: The Program Director's office will complete a position paper (or similar construct) on Price River endangered fish flow needs and submit it for Biology Committee review by September 1, 2010. The Program Director's office will complete the addendum to the White River report and provide a status update and recommendation on the draft Schmidt and Orchard report on peak (channel maintenance) flows for Biology Committee review by ~~December 31, 2010~~ March 15, 2011. 12/13 Price River discussion: **The Program Director's office** will revise the draft Price River position paper and get it to the **Biology Committee** within the next week, with comments due a month later. *Draft Price River position paper sent 12/30/10 with comments due Jan. 31. UDWR may submit a Price River PIT tag proposal for "activities to avoid jeopardy" funding.* 3/11/11: The Committee discussed the draft Price River report 3/1/11; **Tom Chart** will respond to comments and revise the report (in consultation with the Service) and bring it back to the Committee. Any additional comments should be provided to Tom by March 15.

3. *Melissa believes an Environmental Assessment of the impacts of the Humpback chub captivity management plan (also addresses how to deal with captured roundtail chub) will need to be written; Krissy will work with Melissa on the EA. 7/13: Melissa needs to coordinate with the NPS if this is the case and she intends to do that in the next few weeks. 10/6: John Reber reported that **Melissa Trammell** will do the EA for this. 5/6/10 Melissa said she would have a draft for the park by ~~the end of May~~ September 6. May 6, 2011.*
4. The **PD's office** will communicate with Gary White to determine how many and which of the questions from the HBC workshop to focus on. *Pending. **Derek Elverud** will provide the database for Westwater for Gary White to combine with Black Rocks, which will require a separate SOW. 10/6: **Travis Francis** said they plan to complete the reports, then revisit a SOW for assistance from Gary White. 3/10: pending. 4/28: **Derek Elverud** has finished compiling the Westwater data to send to Gary White. Travis Francis is going to combine his Black Rocks data set with the Westwater data and his report (when he has time after he gets out of the field). 1/24/11: Michelle said this will go to Gary White by the end of April 2011.*
5. The **Program Director's office** will prepare a list of issues to be resolved regarding Tusher Wash screening (e.g., what levels of mortality are acceptable for what size classes, potential O&M costs, etc.) to help move this decision forward (and provide that to the Biology Committee and the Service). *Done. 5/6/10: A small group (**Melissa, Kevin McAbee, Dave Speas, Tom Pitts, and Tom Czapla**) will work with **Kevin Bestgen** to review/build on the risk assessment, focusing on understanding existing impacts and what could be gained by various screening options. Tentatively, it would seem the best choice would be fish friendly runners with a screen on the irrigation ditch (contingent on further analysis). BC to submit proposal to MC by 12/31/10. 11/23: Conference calls held 11/10 and 11/24 and*

*scheduled for 12/2. 12/13 BC discussion: The Biology Committee recommended >starting with a literature review (there may be good information from low-head structures in the eastern U.S.); working on outlining what would be needed in a mortality study (including engineering considerations); and further investigating whether the owners would consider full or partial decommissioning. 1/24/11: **Dave Speas** will talk to Reclamation's Tech Center about working on these items (done). 3/11/11: Dave provided a list of questions from Juddson Sechrist; the **Tusher ad hoc group** will review and discuss these. As **Kevin McAbee** gets engineering info from the irrigators, he will share it with the ad hoc group. **Kevin** also will inquire more about the purpose of the 9" (at riverbank) – 20" (at center) concrete cap, to determine whether it is to benefit the existing diversion, or both the existing diversion and the proposed diversion on river left. **Tom Czapl**a will send a Doodle request to set up an ad hoc group conference call within the next 3 weeks (potentially including Juddson Sechrist) (done; call date pending).*

6. The **Program Director's office** will post the revised 2008 and 2009 nonnative fish workshop summaries to the web. *Done.* **Dave Speas** is working to tabulate the recommendations from the 2008 and 2009 workshops and outline how to implement them and the NNFSC will meet to discuss this on June 30. *Done.* In the future, the **PD's office** will quickly complete these workshop summaries and the recommendations included as part of the annual and final report summaries. *11/23: Recommendations being incorporated into basinwide nonnative fish strategy (draft expected September 1, 2011); workshop summary sent to NNFSC for review Jan. 4, comments due Jan. 19. 1/24/11: The Biology Committee extended this date to January 31.*
7. The **Service (GJ-CRFP and the Program Director's office)** will make recommendations for how/where to manage the fish spawned this year at the Grand Valley facility and bring those back to the Biology Committee. *8/18: Will be discussed during the health condition profile meeting. The PD's office needs to schedule discussion//revision of the integrated stocking plan. 9/30: >The PD's office will set up a work group for revising the propagation plan (Krissy and Michelle will assist). 1/24/11: Pending, Krissy thought a meeting could occur in conjunction with a meeting at Dexter (likely in March).*
8. The **Biology Committee** will work on prioritizing their list of potential additional capital projects at a future meeting. *Ongoing.* By September 22, **Committee members and others** who suggested capital project ideas will provide short explanatory/descriptive text (preferably just a paragraph), and then the **Committee** will decide when to take the next steps (individual ranking, group discussion of combined ranking, etc.). *UDWR comments submitted; next BC discussion pending.*
9. **Sherm Hebein** will provide the Committee a copy of the output/report on CDOW's Gunnison River work (e.g., wherein they captured seven razorback last year in sampling half of the river) as soon as he receives it. *8/18: Sherm will send to Angela this week to distribute to the Committee.*
10. **Angela Kantola** will modify the final report format document and put a note in future scope of work formats specifying that authors are to provide electronic versions of draft final reports which can be commented on directly (via track changes or through Adobe, but preferably through track changes in Word [if a Word file like this is too large, the embedded

Excel files can be compressed])). *In SOW format; pending in final report format document.*

11. **Pat Martinez** will schedule a conference call among the signatories to the 2009 Nonnative Fish Stocking Procedures to discuss clarifications. *Pending. 9/30: Pat is first working to address the private sector concerns and issues regarding Rifle Gap management.*
12. The **Committee** will consider the proposal for fixed weirs at Ashley Creek and Stewart Lake drain a contingency at this time, get any comments on the scope of work to the PD's office, and have more discussion at/after the nonnative fish workshop. *Will be considered in context of RIPRAP revisions and FY 12-13 Program Guidance. Dave Speas said an RFP for "activities to avoid jeopardy" funds will be out in the next month or so and may be a source of funding for weirs; Dave Speas will post that RFP to the listserver when it comes out. UDWR will keep the Program Director's office in the loop on this.*
13. **Tom Czapla** will send out the briefing paper he received with the humpback chub genetic data to the Biology Committee (*done*). **Melissa Trammell** will review Dexter's new plan to see if it may impact this (also will talk to Tom Czapla). 3/11/11: **Melissa** will talk to the Park about what they want to do with the chubs in captivity at Ouray and Mumma (likely return them to the river after acclimation) if the Program does not want to keep them. *Melissa suggested assessing morphology now that the fish have matured somewhat (Travis said he's seen the fish and they don't look like humpback to him). The Committee agreed to keep the fish in captivity for now.*
14. **Krissy Wilson** will send Utah's comments on the research framework to **Tom Czapla** who will send these and the Service's to the Biology Committee (*done*). The **PD's office** will meet with the environmental groups (and perhaps other commenters) prior to the Biology Committee discussion/review of the framework so that the Committee can have a fairly focused discussion. *Done. 12/13 discussion:* The Committee decided to pursue the first option (complete the document), and then consider the next steps at the time they review the final draft. It will be helpful for folks to see the 5-Year Reviews and see what those offer (though they may not have the level of detail folks are looking for, in the future, they certainly could reference the more detailed documents). **Committee members** should provide any additional comments on the framework to the Program Director's office (and the Committee) by January 15 (four weeks was allotted in recognition that the Biology Committee *is* the peer review for this work and Biology Committee members very much need to provide a substantive review). **Tom Czapla** will immediately provide a copy of the July version, a working link to the database referenced in the draft report, copies of the comments submitted to date, and a bold, uppercase reminder of when Committee members comments are due (January 15) (*done*). 1/24/11: **The Program Director's office** will revise the document based on comments received to date and provide it to the Biology Committee in advance of the March meeting for final review/approval. *Committee discussion will include recommendations and future direction. 3/11/11: Biology Committee members will e-mail Czapla by March 24, 2011, to let him know if they believe comments have been adequately addressed to finalize the document. If comments have not been adequately addressed, we will put this on the next meeting agenda.*
15. **X*Michelle Shaughnessy's staff** will spend more time with scope of work for evaluating fish condition below the Grand Valley Project fish return and get it (and a recommendation

for which alternative they think would be best) back to the **Biology Committee** for discussion during the January 24 web conference. *1/24/11: Travis said the draft SOW was based on a similar situation on the Yakima River, but the assumptions need to be tested, so Travis recommends conducting a test this year with surrogate white suckers (alternative #3, ~\$18K). **Travis Francis** will review with **Bob Norman** and provide a revised SOW showing alternative #3 at least 2 weeks in advance of the March Biology Committee meeting.*

16. *In advance of the March 1 meeting, **Grand Junction CRFP** will send the Biology Committee information on Price-Stubbs PIT tag results and data interpretation as it relates to direction of fish movement.
17. **Kevin Bestgen** will work with **Pat Martinez** and **Tom Chart** to flesh out the northern pike synthesis proposal for the Committee's consideration.
18. **Tom Chart** will do a final editorial review of the Program's Flaming Gorge spring flow request and seek the approval of the Management Committee via e-mail (*underway*). **Dale Ryden** will contact Ouray NWR about coordination of this experiment and management at Ouray.
19. **Dale Ryden** and **Dave Schnoor** will write up the Ouray hatchery needs (water source for Randlett and generator for Grand Valley) and submit this to the Program via Tom Czaplak. **Dale** also will seek Service funding for these needs. The report will include a discussion the relative risks of power outages at Grand Valley. Melissa suggested that for the long-term, we need a feasibility study for alternative water sources for Randlett.
19. **Tom Czaplak** and **Krissy Wilson** will develop recommendations for where and when to stock the Wahweap bonytail (e.g., floodplains before spawning) and send those to the Committee.
20. The **Service** will add to the contaminants annual report a review of and any recommended modifications to State and Federal hazardous materials spills emergency response programs.
21. The **PD's office** will follow up on establishing a process to track percentages of hybrid suckers using standardized protocol for identification of hybridization at fish ladders and in monitoring reaches.
22. **Harry Crockett** will review draft Aspinall Study Plan and ongoing CDOW Gunnison River monitoring and let PD's office know if CDOW work (or that and just a little extra) could address all or part of Aspinall Study Plan needs to monitor fish community to evaluate effect of flows.
23. The **PD's office** will post UDWR's final #138 report to the web.

Attachment 2

February 24, 2011, DRAFT
Memorandum

February

To: Larry Walkoviak, Director, Upper Colorado Region, Bureau of Reclamation
Heather Patno, Chair, Flaming Gorge Technical Working Group, Bureau of Reclamation

From: Thomas Chart, Director, Upper Colorado River Endangered Fish Recovery Program

Subject: Recovery Program's Research Request for 2011 Green River Spring Flows

The Upper Colorado River Endangered Fish Recovery Program (Recovery Program) supports the Bureau of Reclamation's (Reclamation) operations at Flaming Gorge Dam in 2011 consistent with the 2005 biological opinion (U.S. Fish and Wildlife Service 2005) and 2006 record of decision (ROD; U.S. Department of Interior 2006). The primary objective of our request this year is intended to build on past research to benefit the razorback sucker population throughout the Green River by timing floodplain connection with the presence of wild produced larvae. A secondary objective is to achieve a target flow at the Stirrup floodplain site as part of a specific project where Utah Division of Wildlife (UDWR) will continue to investigate recruitment behavior of juvenile razorback sucker stocked in 2007-2009. Our request this year will require Reclamation and the Recovery Program to revisit Muth et al. 2000 based on a recent synthesis [*in draft*] of long term information the Recovery Program has gathered on razorback sucker early life history and historical operations at Flaming Gorge Dam. We are working under the assumption that flows in the Green River sub-basin will be average or wetter than average, however, we also address the possibility of drier hydrology.

We consider this request a continuation of research into life history requirements of the endangered fish (particularly early life stages of razorback sucker) as well as an experiment in Flaming Gorge operations to further assist in their recovery.

Primary Objective: Time Flaming Gorge releases to connect floodplains when wild produced razorback sucker larvae are present in the system.

As background, we review the anticipated effects (from Muth et al. 2000) of the spring flow targets (magnitude and duration; from Tables 5.4 – 5.6) and the examples of real-time and other year-specific information to be considered in annual patterns of releases (from Table 5.3). The anticipated effect of meeting flow targets in excess of 18,600 cfs at Jensen (Reach 2) as stated in Muth et al. 2000 are:

Significant inundation of floodplain habitat and off-channel habitats (e.g., tributary mouths and side channels) to establish river-floodplain connections and provide warm, food-rich environments for

growth and conditioning of razorback suckers (especially young) and Colorado pikeminnow, and, Peak flows should coincide with peak and immediate post-peak spring flows in the Yampa River.

In keeping with this anticipated effect, the authors identified, among other real-time triggers, the following piece of information that should be taken into account when timing the onset of spring Peak Flow operations:

Initial appearance of larval suckers in established reference sites in Reach 2(e.g., Cliff Creek)

In the past, Reclamation and the Recovery Program have used the real-time razorback sucker larval collection information to influence spring operations, but this has generally occurred at the tail end of the spring releases coincident with the emergence of larvae. The Recovery Program recently contracted with Colorado State University to synthesize the long term body of razorback sucker larval collection information including timing of larval drift, relative abundance, larval entrainment into floodplain habitats, downstream transport of razorback sucker larvae, and environmental correlates of these processes. One of the objectives of this synthesis was to evaluate how well Reclamation's operations at Flaming Gorge Dam (since the Service's 1992 Biological Opinion through more recent ROD operations) have met the aforementioned anticipated effect of enabling entrainment of razorback sucker larvae into floodplain wetlands. This synthesis was called for in the Recovery Program's Green River Study Plan (Green River Study Plan *ad hoc* Committee 2007), which was developed to evaluate implementation of Muth et al. 2000 and is a term and condition of the 2005 Biological Opinion.

In April 2010, the Recovery Program received a draft of that synthesis entitled: *Bestgen, K.R. and G.B. Haines (2010; in draft). Synthesis of floodplain wetland information: timing of razorback sucker reproduction in the Green River, Utah, related to streamflow, water temperature, and floodplain wetland availability.* Since that time, the draft report has undergone peer and Biology Committee review. The report has not yet been revised for final Recovery Program approval, but is expected to be completed in 2011. One of the more significant conclusions from Bestgen and Haines (2010; in draft – see below) is that in recent years, Reclamation's effort to match the peak of the Yampa River with releases from Flaming Gorge Dam has resulted in floodplain connection in the Green River that occurs prematurely to the presence of endangered species life stage (larval razorback suckers) we are trying to benefit.

Bestgen and Haines (2010; in draft) concluded (excerpted from a total of 35 conclusions):

- Abundance of razorback sucker larvae increased in the middle Green River perhaps beginning around 2000, and certainly after 2004, coincident with establishment of larger populations of stocked razorback suckers, indicating successful acclimation and reestablishment of some adults.
- Timing of spawning, hatching, and emergence of razorback suckers in the lower and middle Green River was dependent mostly on exceeding reasonably consistent thresholds of water temperature.
- Timing of first occurrence of razorback sucker larvae captured in light traps in the middle Green River was at or typically after peak flows had passed; peak abundance of larvae was well after flows declined.

- Higher Green River flows resulted in greater areas of floodplain wetland availability and greater entrainment rates.
- Flow releases from Flaming Gorge Dam and timing of occurrence of razorback sucker larvae are mismatched. This was because Flaming Gorge Dam releases in spring that were designed to enhance flood plain-river connections usually occurred too early and well before first appearance of the razorback sucker larvae that flows are supposed to benefit. Releases are also often well in advance of peak flows from the Yampa River, which is not consistent with flow recommendations.
- A flow release trigger that more consistently matches flows from Flaming Gorge Dam with those of the Yampa River, as well as with occurrence of razorback sucker larvae, is needed.
- First captures of larvae may be a better trigger to signal release of Flaming Gorge flows.
- Increasing the magnitude and duration of spring flow releases and delaying their onset to coincide with presence of razorback sucker larvae may be minimally sufficient conditions to enhance recruitment of razorback suckers in the middle Green River, Utah. Increased recruitment is required to achieve recovery of the species in the Upper Colorado River Basin.

Bestgen and Haines (2010; in draft) recommended (excerpted from a total of eight recommendations):

- Implement a schedule of altered timing of flow releases from Flaming Gorge Dam to coincide more closely with presence of razorback sucker larvae, or perhaps, presence of *abundant* larvae, in the middle Green River. Reliable real-time monitoring is already in place to guide timing of releases. In lieu of that, develop relationships based on physical attributes, mostly water temperature and time of year, which would predict timing of emergence of razorback sucker larvae.
- Investigate the feasibility of increased magnitude and duration of spring flow releases from Flaming Gorge Dam, after razorback sucker larvae are present, to maintain connections with floodplain wetlands and increase entrainment rates. Flow releases that simulate unregulated conditions should be used for a realistic test of effectiveness of increased flows to enhance recruitment. Subsequent effects on base flow levels, among other things, will also need to be considered.

Secondary Objective: Assist in meeting the objectives of Recovery Program Project No.C6 RZ-RECR: *Razorback emigration from the Stirrup floodplain*

The Recovery Program has determined that 15,000 cfs is needed to provide an adequate connection (30cm depth in the breach channel) at the Stirrup floodplain site for UDWR to

continue their investigation into juvenile razorback sucker recruitment rates. As in past years, the Recovery Program therefore requests 15,000cfs for 5 consecutive days in Reach 2 to assist in meeting these project objectives. A flow of 15,000 cfs connects several other floodplain habitats. NOTE: a flow of 16,000 cfs would provide a better connection at the Stirrup and was recognized as an important connection flow for other floodplain habitats on the Ouray National Wildlife Refuge (Heitmeyer and Fredrickson 2005)

THE RECOVERY PROGRAM'S SPRING 2011 FLOW REQUEST:

Criterion #1. **The Recovery Program requests that Reclamation's spring 2011 operations be timed to coincide with the presence of larval razorback sucker in Reach 2 habitats.** The Recovery Program can provide a real-time assessment of larval presence through Recovery Program Project No 22f. Based on information provided in Bestgen and Haines (2010; in draft), waiting for this biological trigger will likely cause Reclamation to make spring releases from Flaming Gorge Dam after the Yampa River has peaked necessitating releases in excess of power plant capacity in order to meet the flow magnitude thresholds. The Recovery Program requests that Reclamation limit their spring releases magnitudes to full bypass flows up to 8,600 cfs. This is in deference to possible entrainment of nonnative burbot via the spillway. The Recovery Program fully recognizes the importance of using the spillway (releases in excess of 8,600cfs) in the future to assist in the recovery of the endangered fish, but we would rather proceed with caution until we have more information about the life history of burbot in Flaming Gorge Reservoir and associated risks of entrainment.

Criterion #2a. Contingent on having met Criterion #1, and, if the hydrology remains **Wet-Average, Moderately Wet or Wet Categories** (<40% exceedance) we request that Reclamation release flows that maintain 18,600cfs or greater for two weeks or more in Reach 2. The Recovery Program considers achieving this flow magnitude and duration coincident with the presence of larval razorback sucker as fully meeting our Primary and Secondary Objectives.

Criterion #2b. Contingent on having met Criterion #1, and, if the hydrology drops into the drier portion of the **Average Category** (40 - 70% exceedance) we request that Reclamation release flows that maintain 15,000 cfs for at least 5 days. The Recovery Program considers achieving this flow magnitude and duration coincident with the presence of larval razorback sucker as partially meeting our Primary Objective and fully meeting our Secondary Objective.

Criterion #2c. Contingent on having met Criterion #1, and if the hydrology drops into the moderat drier (>70% exceedance) we request that Reclamation release flows that achieve 15,000 cfs for one day. The Recovery Program considers achieving this flow magnitude and duration coincident with the presence of larval razorback sucker as partially meeting both Primary and Secondary Objectives.

Recovery Program studies to assist in timing of releases and to evaluate the spring release.

The Recovery Program can provide the following information to assist Reclamation with timing their spring release:

- Real time razorback sucker larval collection information (Project 22f)

- A temperature model prediction of when larvae should be present based on an accumulation of Green River degree days (Bestgen and Haines 2010; in draft).

The Recovery Program has the following studies in place to evaluate Reclamation's spring 2011 operations:

- Project 115: This long term fish community monitoring effort in Reaches 1 and 2 can be used to evaluate the effect of high spring releases on the resident fish community.
- Project 22f: Collections in long term sampling sites will be compared to years when Green River flows were dropping or had dropped prior to larval presence. This long term larval razorback sucker monitoring effort may be adjusted to pick up some sampling sites on the floodplain. Additionally, Recovery Program investigators will collect additional larval light trap samples in selected floodplain habitats during the spring release.
- C6-Baerer: Vernal-CRFP will sample several Reach 2 floodplain habitats in the fall for presence Age-0 razorback sucker. Presence of such fish would indicate successful entrainment of wild-spawned razorback sucker during spring, 2011.
- Project 138 and 154: Small bodied fish sampling in main channel backwater; conducted in autumn. This sampling could detect an increase in young razorback suckers (if larvae were swept on floodplain terraces and returned to the river or used floodplain depressions for a short period of time) in 2011.
- Project 160: A specific sampling effort to assess razorback sucker reproduction in the lower Green River.
- Projects 123a, 123b, 128: These nonnative fish removal projects and the Green River Colorado pikeminnow population estimation study call for multiple electrofishing trips in the main channel, which have accounted for many collections of stocked razorback sucker in recent years. We would not expect data collected in 2011 to contribute to an evaluation of 2011 operations, but these studies could detect juveniles from the 2011 cohort in outyears.
- The Recovery Program is developing a specific razorback sucker monitoring plan scheduled for completion in 2011. This plan will likely reference many of the aforementioned sampling efforts but will likely recommend additional sampling strategies that could assist in the evaluation of 2011 spring operations by tracking the 2011 cohort in outyears.

UDWR's Flushing Flow Request:

The Recovery Program has been in communication with the Utah Division of Wildlife Resources (UDWR) as they developed their spring release request (8,600 cfs for 5-7 days) to improve sport fish habitat and to benefit the invertebrate community in the Flaming Gorge tailrace. If timed to meet Criterion #1 (e.g., coincident with presence of razorback sucker larvae in Reach 2), we believe the UDWR flow request would be compatible with the Recovery Program's objectives this spring.

Recognition of Current Conditions

The Natural Resource Conservation Service is currently reporting average conditions in the Upper Green River basin (111% snow water equivalent (SWE)) and wetter conditions in the Yampa and White River drainages (125% SWE). We provide this spring flow request with

hopes that these conditions persist or get wetter. However, if conditions become drier the Recovery Program understands it will become increasingly difficult for Reclamation to meet our spring flow request.

Base Flow Requests

Based on the current hydrologic forecasts the Recovery Program thinks it is prudent to focus on floodplain connection flows in 2011. We understand that spring operations could affect water availability for base flow operations. We reserve the right to address 2011 base flow operations at a later time.

In closing, the Recovery Program appreciates Reclamation's efforts in the past to achieve the flow and temperature recommendations and assist in recovery of the endangered fishes. We recognize that greater reliance on the biological trigger (presence of larval razorback sucker) may require considerably greater volumes of water during the spring in some years, but we feel this experiment is more in keeping with the intent of Muth et al. 2000 and is necessary to assist in the recovery of the endangered fish. Thank you for considering this Recovery Program request for spring flows.

Literature Cited

- Bestgen, K.R. and G.B. Haines (2010; in draft). Synthesis of floodplain wetland information: timing of razorback sucker reproduction in the Green River, Utah, related to streamflow, water temperature, and floodplain wetland availability
- 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 Dam. Upper Colorado River Endangered Fish Recovery Program.
- Heitmeyer, M.E. and L. H. Fredrickson. 2005. An evaluation of ecosystem restoration and management options for the Ouray National Wildlife Refuge, Utah. University of Missouri-Columbia, Gaylord Memorial Laboratory Special Publication No. 8. Puxico.
- Muth, R.T., L.W. Crist, K.E. LaGory, J.W. Hayse, K.R. Bestgen, T.P. Ryan, J.K. Lyons, and R.A. Valdez. 2000. Flow and temperature recommendations for endangered fishes in the Green River downstream of Flaming Gorge Dam. Final Report to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- U.S. Department of the Interior. 2006. Record of Decision on the operation of Flaming Gorge Dam Final Environmental Impact Statement. U.S. Department of the Interior, Bureau of Reclamation, Salt Lake City, Utah.
- U.S. Fish and Wildlife Service. 2005. Final Biological Opinion on the operation of Flaming Gorge Dam. U.S. Fish and Wildlife Service, Denver, Colorado.

Attachment 3

| <u>CDOW rank</u> | <u>Site</u> | <u>Action</u> | <u>Description/Justification</u> | <u>Estimated Cost</u> | <u>Comments</u> |
|----------------------------------|---|--|--|-----------------------|---|
| 1 | Yampa River State Wildlife Area (SWA) | Construct 2 structures plus riprap to protect river bank from further erosion and eliminate significant backwater connectivity. | If bank erosion is allowed to continue & the river articulate with the ponds, a large new pike nursery will be created. | \$27,000 - \$36,000 | Cost estimate believed to be pretty accurate per Area Bio (Atkinson) |
| 2 | Yampa River near Walton Creek confluence | Large scale project to reconfigure Yampa River channel for approximately 0.4 miles Yampa River near USFS/CDOW office. | Extensive project to reconfigure channel and eliminate significant connected backwater habitat. Steamboat Ski and Resort Corp. would have to be very involved as well as the City of Steamboat Springs | \$600,000 - \$750,000 | |
| 3 | 151 Backwater | Isolate and fill | Generally considered a major pike source/nursery, but we have not been able to drive this to completion. | \$300,000+ (?) | Funding is major impediment. CDOW willing to re-engage BOR engineers (Mark Warnke) if BC agrees this is a priority & commits to funding. |
| 4 | Upper Chuck Lewis SWA | Create wetland with creation of approx. 300 ft of new river bank at backwater. | Reduce non-native species habitat; potential to seek wetland project funding | \$60,000 - \$100,000 | |
| 5 | Loudy-Simpson Pond | Prevent connectivity by berming; improve habitat conditions within the pond to facilitate improved recreational fishery potential. | Berm to alleviate concerns about escapement. The pond is believed to at least partially winter kill periodically, as evidenced by high density of bullheads and only young age classes of resident pike. If berm material could be obtained partly by dredging the pond, this could be cost-efficient and improve the habitat for catchable trout and/or warmwater panfish, now that pike translocation has been discontinued. In addition to a berm, measures to alleviate spring flooding of upstream connecting ditches need to be pursued. | 100,000? | Cost estimate very rough. Would be much more positive with local anglers and residents if included the habitat improvement (dredging) component. Potential for I&E, signage, etc. |
| ? | Private pond just upstream of Craig | Reclaim and isolate private pond | Private landowner approached CDOW about removing pike from his gravel pit pond, as they seem to be eating all of the rainbows he stocks for his grandkids to catch. Assume seasonal connection with river, since pike managed to colonize the pond. A gravel/excavating company leases gravel pits from landowner, so might be an opportunity for relatively cheap labor. Also a possible PR payoff if landowner gets a better trout fishery at our expense, might sway reluctant landowners or induce others to approach us. Too preliminary to prioritize at this point. | \$10,000 - \$50,000 | Already have a cooperative landowner. Cost depends upon removal method; probably could not get the berming done without removing the pike. |
| Non-construction projects | | | | | |
| 1 | Yampa river floodplain | Identification and Classification of Potential northern pike source populations in Moffat and Routt County. | Although obvious source populations are known, need to evaluate numerous potential sources in the form of oxbows, gravel pits, and other small ponds on private land in Moffat County in Craig and upstream. Would use available digital imagery plus additional GIS data to identify all potential sources, land ownership, potential for river connectivity. Make landowner contacts as necessary to determine presence or absence of pike, and landowner openness to solutions. | \$10,000 | Cost estimate mostly FTE wages for GIS analyst. |
| 2 | Elkhead Reservoir spillway | Study using PIT tags and stationary PIT tag reader to determine escapement of SMB and NPK from Elkhead | PIT and Floy tag SMB and NPK in Elkhead Reservoir. Desired number of tags etc. would need to be determined. Set-up stationary PIT tag reader in spillway | \$50,000 | Depending on specifications, setup of stationary PIT tag reader might make this a capital construction project. |

