

**Meeting of Green River Study Plan *ad hoc* Committee with
Biology Committee and Water Acquisition Committee**

November 28, 2006, Grand Junction, Colorado

Biology Committee: Tom Chart, Tom Pitts (morning only), Gary Burton, Melissa Trammell, Kevin Gelwicks, Krissy Wilson, Dave Speas, and Bill Davis (afternoon only, via phone). Colorado and the environmental groups were not represented.

Water Acquisition Committee: Boyd Clayton (via phone), George Smith, and Tom Pitts (morning only).

Other participants: Dave Irving (via phone), Pat Nelson, Angela Kantola, Bob Muth, Heather Patno, Rich Valdez, and Craig Walker. Morning only: Tyler Abbott, Trina Hedrick, Leisa Monroe. Afternoon only: Kevin Bestgen (via phone).

Purpose of Meeting: To discuss development of the Green River Study Plan. Rich said comments have been received from Tom Pitts, Melissa Trammell, Bill Davis, and Kevin Bestgen. Krissy said UDWR has comments also, but their e-mail bounced, so they provided copies at this meeting.

Proceedings:

1. Clarify what *Ad hoc* Committee has done so far: Rich reviewed the background of the study plan, which resulted from the 2006 ROD on operation of Flaming Gorge Dam and is a requirement of the biological opinion on the dam (to evaluate and refine flow and temperature recommendations for Flaming Gorge). The Plan is the responsibility of the Service, Reclamation, and Western, and is to be coordinated through the Program with the assistance of the appropriate committees (Biology and Water Acquisition). The Green River Study Plan *Ad hoc* Committee met several times and outlined objectives of the Study Plan (see page 1 of the Plan). The *Ad hoc* Committee felt it was premature to identify a timeline and approach for periodically assessing implementation and evaluation of the flow and temperature recommendations before the plan is reviewed by the Biology and Water Acquisition committees. The *Ad hoc* Committee will recommend modifications to the RIPRAP to implement the Study Plan. Rich noted that the Study Plan focuses on evaluating the flow and temperature recommendations, it is not meant to be an overall document for recovery in the Green River. The *Ad hoc* Committee was careful to use language directly from the flow and temperature recommendations and scopes of work for ongoing studies. The Biological Opinion contains 5 reasonable and prudent measures (RPM's) (which address take) that are important in evaluation of the flow and temperature recommendations (see page 7 of the Study Plan). Rich reviewed Tables A1 – A3, describing the link between the flow and temperature recommendations, anticipated effects and uncertainties (AE/U), and ongoing studies. Table A4 lists ongoing studies. PI's particularly need to review this table and comment on whether their studies in fact address the AE/U's as identified. Rich said Tables A5-A7 are

matrices that evaluate the how well the primary studies address the flow and temperature recommendations. Table A8 brings together the evaluations and information gaps and recommends studies (and priorities) associated with anticipated effects and uncertainties identified for flow and temperature recommendations. The last column of Tables A5-A7 carries over to Table A8. These appendix tables explain *how* the *Ad hoc* Committee got to the information in the tables 1 and 2 in the body of the Study Plan. Rich reviewed Table 1, noting it will be revised based on discussion of the tables in the appendices. Table 2 shows the 18 highest-ranked AE/U's in priority order.

2. Address comments and questions from BC & WAC on process of study plan development. Pat Nelson asked about the language “adverse effects” versus “anticipated effects” used in the Study Plan. Bob Muth said the “adverse effects” language came from the Biological Assessment and Biological Opinion. Tom Chart said “adverse effects” refers specifically to adverse effects on endangered fishes. Tom Chart suggested reviewing the language and clarifying it, as needed. Tom Pitts said he suggested noting in the tables whether studies are ongoing or pending and their anticipated completion dates (this could go in Table A4 if it fits best there). Given confusion about the meaning of ongoing or pending, Rich will add a column to identify the status of each study. With regard to UDWR’s comment that some uncertainties read like hypotheses and others like statements, Rich said they tried to be consistent with the flow and temperature recommendations, and will clarify that. Dave Speas and Tom Pitts commented that we need to be sure that studies are addressing the uncertainties and data gaps; if not, we need to revise studies to make sure they are addressed. Dave Speas asked Dave Irving and his staff to carefully review the Study Plan in this regard. Rich suggested the best way for PI’s to review the document is to focus on the tables in the appendix, look for their studies, and make sure the objectives and links are properly characterized. Melissa emphasized the clarification on the top of page 15: “Y” for yes means that the study does address the AE/U, but there could still be questions remaining when the study is completed. This is particularly confusing in Table A8, for example, so perhaps there’s a better way to better designate all of this. For example, perhaps prioritize each recommended study in Table A8 separately. Tom Pitts suggested that we need to explicitly tell the PI’s the data needed to address the AE/U’s (e.g., hypotheses to be addressed) and *ask* the PI’s if their studies will do that. In asking the PI’s to judge whether their studies are adequately addressing the AE/U’s, Craig Walker suggested having them use a ranking of 0-5 rather than “yes” or “partial.” If the studies aren’t addressing the AE/U’s, they will need to be revised/revamped. Melissa provided similar comments regarding specifically linking study objectives to AE/U’s. Tom Pitts suggested adding another column to Tables A1-3 to identify the information needed (some of this may already be in subsequent studies). Bob Muth said one reason we wanted to have these checkpoints is to make sure that studies are in fact meeting the objectives they are intended to meet. Tom Pitts asked how the prioritization in Table A8 would be used. Further prioritization may be needed to separate out: 1) risk to the fish (what’s needed for recovery); 2) how soon information is needed to make a decision; and 3) the reach to which it applies. Melissa said she

revised Table 2 in her comments to avoid the repetition of the studies text for floodplains, backwaters and nonnatives. She also moved priority rank to the first column. And she listed studies that addressed the AE/U's from Tables A5-7 (but didn't link specific study objectives to specific AE/U's).

3. Request feedback from the BC & WAC on the following:
 - a. Is our list of 41 anticipated effects and uncertainties (AE /U) complete?
 - b. Have we characterized the Program studies correctly in their ability to address the AE/U? See discussion, above. Review and comment from PI's is particularly important to answer this question.
 - c. Does the group agree with our prioritization process? (Also see discussion, above.) Bob Muth asked how we want to address priorities (the first 5, 10?) Gary Burton emphasized the need to prioritize items tied to environmental commitments in the ROD. Tom Chart noted that linkages/redundancies between some of these studies may help reduce the priority list. Melissa noted that all of the studies in Table 2 apply to each uncertainty, so we need to determine how we will prioritize studies. Bob Muth said he thinks we primarily need to prioritize new studies needed to fill in information gaps. Heather noted that we also need to discuss how ongoing studies need to be revised to address data needs most efficiently. The following criteria for prioritization were identified:
 - 1) Environmental commitments identified in the ROD (2 environmental commitments)
 - 2) Risk to the fish (if something we're doing may actually be harmful – relates to adverse effects as described in the BA and BO). Do we also need to consider priorities based on positive or neutral effects? Perhaps the first thing to do is to avoid risk, then to have a positive effect.
 - 3) What's required by the BO? (5 RPM's) What about the terms and conditions in the BO, which spell out how the RPM's will be carried out and are actually more binding than the RPM's? This discussion on pages 7-8 needs to be expanded.
 - 4) What's needed for recovery? (Is this really valid? Can we not assume that if it's in the BO it's needed for recovery? Is there anything in the recovery goals which we need to pay specific attention to in this regard?) This criterion may not be needed, but the *Ad hoc* Committee will discuss it. Don't all the AE/U's address recovery? Perhaps discussion in the text can cover this. Melissa noted that backwater habitat is listed as an uncertainty, but is not covered in the environmental commitments or the RPM's. Perhaps other guidance documents (like floodplain management, geomorphology, etc.), which are listed in the BO, address these.
 - 5) How soon information is needed to make a decision.
 - 6) The reach to which it applies (e.g., we have little control over Reach 3, so may be a lower priority in relationship to the flow and temperature recommendations).

Each one of these criteria would be shown (high/medium/low) in a separate column, with perhaps a final column for a synthesis ranking. Not all these criterion carry the same weight, however, so we may want to weight them.

- d. Are our four areas of focus (floodplains, backwaters, nonnatives, temperature) the right ones, and do you agree with order of how those four areas fell out?
4. What does *ad hoc* need to do; what did we miss. The *Ad hoc* will need to consider PI's comments on how studies address AE/U's; revisit the table where they first started identifying priorities (using the criteria the Biology Committee identified above, although this isn't expected to result in a radical change); revise Table 2 (probably something along the lines of what Melissa has suggested); identify information gaps and prioritize them (e.g., recruitment of razorback to the river). Melissa noted that the list of nine studies in the recommended timeline (pages 28-29) already addresses this, but it needs to be prioritized. We also still need to make sure we're covering all the data needs. The *Ad hoc* Committee will revise the timeline to mimic the RIPRAP.
 5. *Ad hoc* will listen to comments, suggestions, recommendations:
 - a. Reviews submitted to date from Pitts, Davis, Trammell, Bestgen, UDWR.

Trina reviewed comments submitted by UDWR. Trina said she didn't spend too much time on AE's, but >will review those again by Dec. 8 with specific studies in mind.

Melissa said most of her comments have been addressed in previous discussions today. She emphasized the need for Table A4 to provide specific linkages between objectives and uncertainties. Some of the uncertainties are a little vague and may need to be made more specific. The Committee discussed how detailed the Study Plan should be and how/if it should be modified/revised in the future. Tom Chart said he believes the Study Plan should identify how we'll "close the loop," and identify any need to revise the flow and temperature recommendations.

Bill Davis said his comments #3, 5, 7, 8, 9, 11, 15-23 are primarily editorial. #1, #21, #26: Bill said he believes studies of physical conditions are more likely to yield useful results than studies of larval growth, etc., while fish numbers remain so low. Melissa said she believes we need to answer the recruitment question now. She agreed we've probably done enough *in situ* studies of growth and survival of stocked fish into floodplains. Rich agreed with Bill's comment regarding the need to define their use of the term "recruitment." #2: Reducing impacts to power generation should be one of our goals (both for the Study Plan and for the flow and temperature recommendations). Dave Speas pointed out that this is an environmental commitment (see page 6) which is reflected in Table 2 under U14 (page 41). #4: Need to clarify that hydrologic conditions are the primary driving factor

for releases from the dam. #6: Gets to the issues of priorities and tradeoffs (e.g., supports text on page IV). Rich commented that this also relates to our earlier discussion on priorities. Dave Speas suggested adding Bill's example tradeoff of "doing things with flow to reduce nonnative impacts while using flows to enhance floodplains and backwaters" parenthetically to Section IV, last paragraph. #10, #13, #25: Bill emphasized that spillways are only for emergency use. Dave Speas and Tom Chart countered that use of spillways and the impact to power was addressed in the EIS. Bill said this would have to be dealt with at the Commissioner level, and seriously doubts it would ever be approved. Gary Burton noted that item #2 on page 27 addresses minimizing spillway use. #12, #14: Support addressing nonnative fish response to flows. #24: Bill believes we're over-reaching our knowledge base to suggest we currently know which nonnative fish species are most problematic. Melissa said she believes we do know that smallmouth and northern pike are currently most problematic, but agrees we can't ignore red shiner. Bill pointed out that we seem to be losing most of the endangered fish at <1", which points more to small-bodied nonnatives (and perhaps smallmouth bass) than to northern pike. Rich noted that UDWR brought up the issue of channel catfish in their comments.

Kevin Bestgen said he scanned the entire report, but focused primarily on the executive summary; however, he would be happy to provide further review. Kevin said he didn't add to uncertainties, but the research framework may provide insight to this. Kevin agreed with Melissa regarding the need for the recruitment study. Kevin believes razorback sucker larval monitoring is particularly useful (e.g., for real-time management of flows, etc.). Rich asked Kevin if he believes floodplain information needs to be synthesized more broadly than at the PI level; Kevin recommended a stepwise approach, first getting all the information on razorback early life history together, then perhaps integrating that with growth rates, flood frequency, flood inundation, etc. This will have implications for stocking numbers, entrainment rates, and more. Bob Muth emphasized and the Committee agreed to the need for integrating the work on the entrainment study and related research (e.g., floodplain connectivity, spawning bar information, etc.). It's unclear if an additional scope of work would be required to tie all this together.

Tom Pitts had to leave early, but emphasized the need for integrating/synthesizing all this information in 2008-2009 (Bob Muth mentioned that some of this synthesis may actually occur earlier). Dave Speas noted that a number of Tom's comments address the need for a process by which the information gets back to decision makers; Dave suggested the *Ad hoc* committee make recommendations in that regard (perhaps with some kind of flow chart diagram). Dave Speas, Tom Chart and Bob Muth agreed that Tom's comment regarding the need for the study plan to identify how we'll refine the flow and temperature recommendations is probably the crux of his comments, but beyond identifying a general process, actual revision of the

flow recommendations gets into a whole regulatory process. With regard to the importance of work in Reach 1, Tom Chart said he'd like to discuss Tom Pitts' comments with him. From a Service perspective, Tom Chart said he believes work focused on Reach 1 is appropriate. Dave Speas and Melissa Trammell agreed the Study Plan appropriately addresses Reach 1. >Rich will find out if Tom Pitts would be available to discuss his comments briefly with the *Ad hoc* Committee during their December meeting. Melissa Trammell noted (with regard to Tom Pitts' comment at about canceling studies) that Tom mentioned earlier today that he realizes some of these studies may have other purposes, and therefore shouldn't be canceled.

Since the Study Plan will come back to the Biology Committee (primarily as guidance for 2008 work), Rich asked what else is needed in the Study Plan to most help the Committee. Bob Muth said program guidance will draw on the Study Plan. Dave Speas said the Study Plan also will feed into the decision process for Flaming Gorge (input would be needed ~January, prior to the spring TWG meeting). Dave asked if we need to build in more PI office time to review/evaluate/analyze data during and shortly after the field season in order to meet this timeframe. Kevin Bestgen said this is possible, but PI's will need specific direction as to the information needed. Rich agreed and suggested tying this back to data needs identified in the Study Plan. Bob Muth suggested the Program should make some formal assent to the 4-tier communication process for Flaming Gorge releases, if we haven't already done that (>Bob Muth will review the meeting summary where this was addressed). The Study Plan should contain text that the Program will need to make a specific request if it wants flows that depart from the flow recommendations. Melissa asked about requesting flows outside the parameters of the flow recommendations; Tom Chart said this was handled by informal consultation under the 1992 opinion (although they weren't research request). More specifically, Melissa said the flow recommendations call for matching the Green River peak flow to the Yampa River peak flow; however, we may at some point want to experiment with an earlier peak on the Green to entrain larvae. What would be needed for that? How this would be addressed goes beyond the Study Plan, but we may want to take this up with Reclamation. Melissa asked if we've studied larval cold water shock tolerance and Kevin Bestgen said Chuck Berry did that.

- b. Comments from other BC & WAC members – See foregoing discussions.

Further Study Plan Development: What happens after meeting with BC & WAC?

- *Ad hoc* will assimilate and evaluate comments.
- *Ad hoc* will meet December 20-21 in Denver to revise Study Plan (and will try to highlight changes for ease of review), as necessary. >Rich will put together a draft matrix of the criteria for prioritization to the *Ad hoc* in advance.
- >*Ad hoc* will request reviews from PIs by December 8th. (Especially from the Larval Fishes Lab, Vernal CRFP and Moab UDWR).

- *Ad hoc* will get the revised Study Plan back to the BC (& WAC, if interested) well in advance of the BC meeting on January 19.
- Preliminary Study Plan to Management Committee at meeting Feb 8, 2007 (then to Implementation Committee in advance of March 14 meeting).

Flow request and research needs – None for 2007.

Assignments

1. The *Ad hoc* Committee will immediately ask PI's (especially Larval Fishes Lab [Kevin Bestgen], UDWR [Moab and Trina Hedrick], and Vernal CRFP to provide additional review of the Study Plan by December 8. Their review should focus on whether their studies are correctly characterized in their ability to address the AE/U.
2. Rich will ask Tom Pitts if he could be available via phone to discuss some of his comments with the *Ad hoc* Committee on December 20-21.
3. Bob Muth will review the Management Committee meeting (or conference call) summary where the 4-tier communication process on Flaming Gorge releases was discussed to see if it was explicitly agreed to.
4. Rich Valdez will provide a draft matrix of the criteria for prioritization to the *Ad hoc* Committee in advance of their December 20-21 meeting so they can begin to fill it out.