

## Whetton, Linda A

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**From:** Whetton, Linda A  
**Sent:** Friday, June 15, 2012 11:03 AM  
**To:** 'Balsom, Jan'; 'Barger, Mary'; 'Barrett, Clifford'; 'Bullets, Charley'; 'Caramanian, Lori'; 'Castle, Anne'; 'Christensen, Kerry'; 'Cox, Jerry'; 'Davis, William E.'; 'Dongoske, Kurt'; 'Downer, Alan'; 'Ellsworth, Craig'; 'Halliday, John'; 'Harms, Paul'; 'Harris, Christopher S.'; 'Heffernan, Beverley'; 'Heuslein, Amy'; 'Hughes, Chris'; 'Joe, Tony'; 'Johnson, Rick'; 'Kantha, Vineetha'; 'Kearns, Leanette'; 'King, Robert'; 'Knowles, Glen W'; 'Kowalski, Ted'; 'Kubly, Dennis'; 'LaGory, Kirk'; 'Lash, Nikolai'; 'Myers, Gerald'; 'Orton, Mary'; 'Palmer, Clayton'; 'Peterson, McClain'; 'Rozelle, Marty'; 'Schill, Chris'; 'Shields, John W.'; 'Stevens, Larry'; 'Stewart, Bill'; 'Waldron, Keith A'; 'Yeatts, Michael'; 'Anderson, Mark'; 'Bair, Janet'; 'Benemelis, Perri'; 'Bennion, David'; 'Cantley, Garry'; 'Capron, Shane'; 'Chaudhry, Todd'; 'Cole, Jeff'; 'Crawford, Marianne'; 'Dahl, Kevin'; 'Erlandsen, Evelyn'; 'Fitzpatrick, Lesley'; 'Jackson-Kelly, Loretta'; 'James, Leslie'; 'Jansen, Sam'; 'Jordan, John'; 'Makinster, Andy'; 'Morel, James'; 'Ostler, Don'; 'Seaholm, Randy'; 'Skrzynski, LeAnn'; 'Thiriot, James'; 'Trubee, Meghan'; 'Van Haverbeke, Randy'  
**Cc:** 'Davis, Phil'; 'Fairley, Helen'; 'Garrett, David'; 'Grams, Paul'; 'Mankiller, Serena'; 'Melis, Ted'; 'Pistorius, Shelley'; 'Schmidt, John "Jack"'; 'Sogge, Mark'; 'Vanderkooi, Scott'; 'Brindle, Todd'; 'Carter, John'; 'Dickinson, William'; 'Healy, Brian'; 'Kyriss, LaVerne'; 'Moore, Bruce'; 'Nimkin, David'; 'Pellegrino, Colby'; 'Shanahan, Seth'; 'Swan, William'; 'Wegner, David'  
**Subject:** FW: BAHG Budget Issues for TWG  
**Attachments:** FY13-14 BWP TWG prep final draft.doc  
**Importance:** High

See Shane's message below. Safe travels for next week.

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**From:** Shane Capron [<mailto:Capron@wapa.gov>]  
**Sent:** Friday, June 15, 2012 8:16 AM  
**To:** Whetton, Linda A  
**Cc:** Caramanian, Lori; [leanette@maryorton.com](mailto:leanette@maryorton.com); Mary Orton; [M3Research@starband.net](mailto:M3Research@starband.net); Knowles, Glen W; Jack Schmidt  
**Subject:** BAHG Budget Issues for TWG

Linda,

Please forward the following document to the TWG for our upcoming meeting and discussion of the budget, also post to the TWG web site. Many thanks to Mary Orton and Leanette Kearns for assisting us in putting this together, and to the BAHG for engaging in the budget discussion and doing their best to bring comments forward during this process. Also, I want to thank GCMRC and Reclamation for taking the time to engage with the BAHG and responding to comments and being very helpful in describing the workplan to us.

In my review of the budget I felt that GCMRC made a number of advances that we should note. First, there is a level of discussion in the workplan that we haven't seen before, a tone that includes education and learning. It assumes we're smart people interested in these projects. It describes how GCMRC, cooperators, and others came to these decisions about the workplan and the needed research and monitoring. I learned a lot reading this workplan and I found the document contained very little "fluff" -- it was packed with excellent writing describing the scientific rationale for projects, critical thinking, and most of all a recognition that science isn't perfect and along the way we will make mistakes and need to make course corrections. Second, I found the workplan described the important hypotheses which need to be tested, a description of how we will test them, and then a discussion about how we will synthesize that information to distinguish between those hypotheses. I felt this was a giant leap forward, and gives me confidence that GCMRC is approaching these critical questions with a sound scientific approach. There was obviously a lot of critical thinking that went into this plan, and it shows. Of course it isn't perfect, and GCMRC is making changes as we go along and may have an updated version at the TWG meeting. So I think we should congratulate all of the scientists and staff for such a

tremendous effort - I know this involved many agencies and cooperators, thank you all for the hard work and your dedication.

At the TWG I know we will have more issues to consider and will have discussions about the cultural monitoring and other new aspects of the program. I look forward to working out these issues with you all. Again, further technical issues we can't resolve will go to Lori Caramanian at DOI for their consideration. Policy issues will go to AMWG, if we have any. We will be considering a motion to AMWG to recommend that they recommend approval of the budget and will strive for consensus on that motion.

Jack's leadership has moved the ball significantly forward at GCMRC -- and I think there is a TWG (adaptive management) component that is important as well. Jack, Ted Melis, and myself recently had a discussion about the core monitoring plan and how to move forward. I have agreed to do another re-write of the document to bring it up to date and remove some of the sections that provide too much detail that is already out of date. I hope to work on that with the ad hoc group between our June meeting and October. Beyond that, I see a critical role for TWG to review the modified science questions posed by GCMRC in this workplan and help work with GCMRC to develop a monitoring and research plan for the next 5 years -- a document that includes a longer vision than the 2 year workplan, that considers how we will answer these critical questions over decadal scales and not just single year projects. This will provide stakeholder input on those critical science questions and help give direction to GCMRC about the type of information we think is important. We can talk more about this at the TWG. I think that Jack is very open to having program documents that are more of a collaboration between TWG and GCMRC and I think we should take advantage of this possibility. We can talk more at the TWG.

Shane

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## **GCDAMP FY13-14 Budget and Workplan**

### **Issues to be Addressed at the TWG Meeting, June 20-21, 2012**

This document is intended to help TWG members prepare for the TWG meeting that will be held on June 20-21, 2012 in Phoenix, Arizona. It is the result of the work done by TWG and BAHG members, and Reclamation and GCMRC staff, to raise and resolve questions and issues with regard to the draft Glen Canyon Dam Adaptive Management Program FY13-14 Budget and Workplan.

The resolved issues are placed toward the end of this document so that all TWG members can understand the resolved issues. These will not need to be discussed again at the TWG meeting.

Note: The page numbers below are in reference to the PDF document's page numbers, **NOT** the page numbers printed on the document.

#### **Cultural Resources Comments re: Tribal Meeting held June 6**

Mike Yeatts made these comments during the June 7 webinar. They may be raised during the TWG meeting.

1. Cultural portions of Reclamation's workplan were seen as vague. Most felt it was going in right directions, but more detail needed.
2. Need to integrate tribes into the projects. Tribes should be active participants.
3. Need to integrate TEK into the workplan more broadly.
4. Continued concern about funding and lack of CPI in participation line items.

### **Questions and Issues to be Addressed at the TWG Meeting**

#### **USGS Budget and Workplan**

##### **Project L**

1. P. 233: If SAs work on LTEMP has been eliminated, where will that independent review occur? (Leslie James)
  - Jack: This is a question for DOI, not for GCMRC. I understand DOI is developing an independent peer review protocol policy. If the SAs are part of that process, I understand the SAs budget would be increased by LTEMP funds because it is inappropriate to use AMP funds to support LTEMP activities.
  - This will be addressed at the TWG meeting for a possible recommendation to AMWG. Leslie James and Don Ostler will prepare a proposal for the SAs' involvement in the LTEMP.

#### **USGS and Reclamation Budget and Workplan**

2. Where will the recommendations from the SEAHG be implemented? (Leslie James)
  - Shane will ask for update at the TWG meeting from the DOI Interagency team that is determining what socioeconomic issues would be addressed under LTEMP.

3. Given my recent review of other federal work plans in another forum, has the federal salary freeze been reflected in the salaries included in this BWP? (Leslie James)
  - Will give the answer to this question at the TWG. (Glen Knowles)

### **Technical Comments**

#### **BOR Budget and Workplan:**

4. P. 6: Consider changing “Experimental Carryover Funds” to “Experimental Funds” and changing “Native Fish Conservation Contingency Fund” to “Native Fish Conservation Contingency Fund Carryover”. Rationale: the experimental fund is an annual fund, when it carries over it goes to the native fish line. (Shane Capron)
5. P. 12: Recommend that until the POAHG has a specific work plan recommendation with deliverables, that this activity be reduced, with the funding potentially provided to have a synthesis of the Knowledge Assessment workshops completed this year. (Leslie James)
  - Sam will have a POAHG meeting ASAP and will recommend a budget. (Glen Knowles)
  - SAs agree there is a need for a Knowledge Assessment document; could be internal working document. At least at standard of last Knowledge Assessment document. (Dave Garrett)
  - We need finalized, published product under USGS imprimatur. (Shane Capron)

#### **USGS Budget and Workplan:**

##### **Project A**

6. P. 57: Project A.4 may be of immediate concern to GCDAMP, especially with the HFE implementation looming in the horizon. Recommend that project should be funded. (Vineetha Kartha)
  - If funding for this project has not been identified by the time of the TWG meeting, it may need to be discussed then.

##### **Project C**

7. P. 96: Clarifying question: please clarify the statement “Equalization resulted in the evacuation of cold water from deep portions of the reservoir. These unusual conditions resulted in the warmest release temperatures since 2005, reaching 15.2°C on November 12, 2011, in spite of higher reservoir elevations.” (Shane Capron)

##### **Project F**

8. P. 132: F.1, Question – It looks like only one annual trip is being planned, please clarify one trip or two and why only one trip is needed now when we used to conduct two and AGFD has provided rationale for two in past discussions? (Shane Capron)
9. P. 135: F.4.3 – We had been promised by FWS and GCMRC a Chute Falls translocation plan before the next budget cycle. It appears that document has not been prepared and no mention of it is in the description. Please clarify when we can expect to see a Chute Falls translocation plan? We believe it is important to understand the goals of the project, methods, research plan, important results to date, rationale for continuing it, etc. The second to last sentence on next page talks about a peer review, that would be helpful as well but we think a draft translocation plan would be a good starting point. (Shane Capron)

10. P. 138: F.7.1 – This sentence doesn't seem to fit together: "Monitoring will focus on midday collections because drift rates tend to be more variable, but higher, during nighttime hours. Seven samples will be collected every six weeks from each location." Is it important to sample midday because of variability, or better at night? (Shane Capron)

### Project J

11. P. 198: On the bottom of the page this research question is highlighted, "Therefore, a key research question that needs to be resolved is not whether cultural sites are eroding or otherwise changing but whether they are eroding or changing faster or in a significantly different manner than they would if the dam were not present or was operated differently than it has been up until now." – Question, is this the right question? I understand the part that we want to understand if the dam was operated differently, but is it appropriate to have the larger question, if the dam were not present? (Shane Capron)

### Project L

12. P. 233: Table, in the line starting "Participation in phone calls..." 50% should be changed to 5%. (Shane Capron)

### General

13. There are a lot of river trips identified in this work plan. I would like to see a table of proposed projects time of year when these trips would take place. Do we have the logistical support to conduct all this work especially if non-native control takes place? (Bill Stewart)
- I have passed this on to Fritz (in charge of logistics). We do not have an answer yet, but **we are developing an answer**. There will be logistical challenges. (Jack Schmidt)

### Additional Questions

14. Creel Survey (Bill Stewart)
- Bill referenced his memo that was sent to all TWG and BAHG members. Historically, AGFD has funded a creel survey at Lees Ferry. Due to recent budget cuts, they can no longer fund it annually, and there will be no surveys in FY13-14. These surveys are important because we obtain data we cannot obtain with electrofishing. We see the larger fish caught by anglers that are not as vulnerable to electrofishing. We also see what is being harvested, and can assess how management recommendations are affecting the fishery.

Proposal: Maintain the annual creel survey at \$25K per year for FY13-14.

In answer to a question about how AGFD decides on priorities, Bill said the Regional staff made this call based on tighter budgets and other bodies of water (e.g., Lake Mary) that have higher visitation rates.

Bill concluded by saying that the 2009 PEP panel recommended maintaining the survey.

- I support the proposal. Continuity is important. We have had other examples along the river where there was discontinuity in surveying, which led to a void of information when the data

collection was re-established. He noted that it seems like small amount of money. (John Jordan)

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## Resolved Questions and Issues

The following questions and issues were resolved during the webinars and so will not be raised again at the TWG meeting

### USGS Budget and Workplan

Jack Schmidt requested that everyone read pages 32-38 of the budget document. These are introductory comments that outline the philosophy of how the projects fit together, how they address key science questions, and how they address Desired Future Conditions.

### Project A

15. P. 49-55: How is Project A.1 different from Project A.2 ? (Vineetha Kartha)

- Project A.1 is sandbar and camping beach monitoring. This is the continuation of the long-term monitoring of sandbar study sites, traditional surveying from Lees Ferry to mile 275, using air photos. This project used to be part of the GIS and remote sensing project.

Project A.2 is sediment storage monitoring. Its purpose is monitoring the sand in storage in the system that goes to build sandbars when we have high flows. It will help to determine what is causing the decline of sediment in the system. The sites are deep pools and eddies, which are not monitored in A.1. (Paul Grams)

- This project is fueled by Project B, which is determining how much sediment goes into and leaves the Grand Canyon. It tells us what is available to be stored on the river when HFEs are triggered, not under a rapid response paradigm. This sediment is the fuel for the high flow sediment that will be used to rebuild sandbars. Project A.2 provides mapping and quantification of how much sand is on the bed of the river. This is the “foundation of the house” on which the camping beaches and backwater habitats are built. A.1 quantifies what sticks out of the river: beaches and riparian habitat. Focus of A.1 is to understand the net effect of the HFE program. We have uncertainties about whether we can blindly extrapolate the NAU time series to describe the situation in the river; this project should address this uncertainty. (Jack Schmidt)

16. P. 57: Is Project A.4 related to Project A.2.2? (Vineetha Kartha)

- A.2.2 is grouped with A.2 because as part of the sediment storage monitoring described above (foundation of sand storage), it is essential to know we are monitoring sand as opposed to changes in gravel. When we are mapping the bed of the river, we need to distinguish between textures: sand, boulders, etc. A.2 is improving our methods through automation and other improvements. Project A.2.2 is mapping whether it is sand or gravel, and determining the grain size of sand (which is important for our ability to build sandbars).

Project A.4 is research – improving our understanding of the grain size of the sand in the system, aerial coverage of sand, and how that interacts with the flow to result in the observed concentration of suspended sand in the water. The fundamental science question is the relationship between the sediment on the bed of river, how it becomes entrained into the flow, how it becomes suspended concentration, is carried downstream, and builds sandbars. This is not a monitoring project; it is improving our ability to predict grain size and amount based on suspended sediment concentrations. (Paul Grams)

- The bottom line is we are trying to maintain resource of sand and mud in a river with severe sediment deficit. We want to realize all the benefits from all the sediment from the Paria. These are our efforts to understand the linkages between how much sediment is in the bed of river, and what controls how much sediment can become part of eddy sandbars. This is basic research. Dave Rubin is lead on A.4. He is one of the intellectual leaders of our science in Grand Canyon.

A.4 is critical to understanding HFEs and for implementing the HFE protocol, but it is not funded, because we have prioritized monitoring over research. I am doing my best to find funding for this project and think we will be able to do it. (Jack Schmidt)

17. In determining the foundation, there are surface and volume measurements. Is the variability for the surface area on the bed greater than the variability in determining depth of the deposit? (Dave Garrett)
- Sand area is less variable, we believe, than the volume. However, we do not have enough data to prove this. (Paul Grams)

### Project D

18. P. 102: Unclear exactly what is being proposed under project D. Proposed work shows 4 projects, while budgets only shows 3 proposals (Bill Stewart)
- **We will correct this a numbering error** in the next iteration of the budget. There are two elements to this project: D1 and D2. D2 has two sub-elements – 2.1 and 2.2. (Scott Vanderkooi)

### Project F

19. P. 132-143: Budgets for project F do not appear to align with budget table on page 143. (Bill Stewart)
- **We will correct this typographical error** in the next iteration of the budget. The correct number for F4 is \$833,000. The totals are correct; however, the numbers do not align because we had merged some projects. Each of the elements will have separate budget in the revision. (Jack Schmidt)

### Project H

20. P. 160: How does Project H.2.2 yield data that is different from certain projects identified in F? (Vineetha Kartha)

- Project F.7 is a continuation of the existing foodbase monitoring program. H.2.2 is a research approach to foodbase monitoring. The difference is that F.7 is monitoring changes in invertebrate drift over time, but only at two sites: Glen Canyon and Diamond Creek. Project H.2.2 proposes adding more spatial resolution to understand how invertebrate drift changes over space. The temporal data is important for monitoring the effects of HFEs on the foodbase, but it does not show how the situation changes over the river. Project H.2.2 will give us more spatial information which, in combination with the temporal data, will improve our understanding of how food availability influences fish distribution, feeding habits, and growth. (Scott Vanderkooi)

21. P. 162: How does Project H.4 further the goals of the GCDAMP or the DFCs? (Vineetha Kartha)

- This helps us put the tailwater fishery and conditions in Glen Canyon in the context of other river systems. In addition, it will provide opportunities for collaborative work with other scientists in other river systems. We will share ideas for collecting data and learn from their successes and failures. This also may provide opportunities to conduct experiments we cannot do in Grand Canyon, such as TCD in other systems. The project will provide the opportunity to further the goals of AMP, particularly those of aquatic ecology and fisheries. (Scott Vanderkooi)

## Technical Comments

### **BOR Budget and Workplan:**

22. P. 28: Given the most recent schedule for the LTEMP, is funding (\$10K) necessary in FY 13 to “implement the LTEMP”? (Leslie James)
- The cultural program implementation budget is still an early draft. There is a lot of uncertainty on this line. Depending on NHPA needs, we may need these funds. We will have some key discussions, including with tribes, before making decisions on this. (Glen Knowles)
  - Perhaps you could describe it as planning instead of implementation. (Leslie James)
  - Perhaps it could be used for Section 106 compliance. (Mike Yeatts)

### **USGS Budget and Workplan:**

#### **Project A**

23. Given my recent review of other federal work plans in another forum, has the federal salary freeze been reflected in the salaries included in this BWP? (Leslie James)

- For GCMRC, the FY13 salaries are flat; the freeze is incorporated. FY14 included a 3% increase. (Scott Vanderkooi)

24. P. 40: Project A needs to have a stronger correlation with other GCDAMP resources as identified in the DFCs (in addition to maintenance of camping beaches); nearshore habitats for native fish, marsh and riparian habitat for fish and cultural resource preservation. (Vineetha Kartha)

- Excellent question. Chapter 2, page 33, I tried to address how projects fit with broader AMP resources. I tried to express how these link back to resources. See chapter 2 (starting page 34) for the questions we are attempting to answer. (Jack Schmidt)
25. In adaptive management, stakeholders usually develop the questions. Here, the science community has crafted the questions. (Dave Garrett)
- I believe I have helped stakeholders clarify their questions. We are the scientific experts; we think it is our responsibility to help guide the stakeholders as if we were a team. If stakeholders think we are giving short shrift to their fundamental questions and goals, we want to hear that so we can revise and adapt our program. (Jack Schmidt)
  - This budget is a great step forward in level and detail of science. The process we used in the past to ensure the science program and the stakeholder questions were aligned was the Monitoring and Research Plan, which collaboratively developed the questions to be answered. It will be critical in the next year or two to step back, take all the great work you have done, develop it into an MRP. This way, we ensure buy-in for these questions and the work that needs to be done. (Shane Capron)
26. P. 52: Project A.1.3 seems like a project that is better assimilated/absorbed into other projects rather than a standalone project. It also does not seem of immediate concern for GCDAMP purposes. (Vineetha Kartha)
- It could be argued this project could be part of A.1.1. However, I chose to highlight it as separate element because it is in addition to the basic monitoring. It is important because when the data we have now are from the NAU time series of sandbar monitoring: we have a line and the median sandbar volume. However, there is more to a good camping beach than this. This project will aid in the development of additional metrics beyond area and volume. (Paul Grams)

### **Project B**

27. P. 74: Project B needs to have stronger correlation with other resources as well, especially effects on fish populations, and habitat. (Vineetha Kartha)
- **We will edit the project description to make this clearer.** (Jack Schmidt)

### **Project D**

28. We advise including language to indicate that the methodologies used to obtain population estimates within the aggregations may be expected to adaptively change contingent upon annual results obtained, and thus, there are a large number of logistical uncertainties that could dictate exactly what approaches/strategies may ultimately be used (i.e., when, where, and how) to refine population estimation in the aggregates. (Janet Bair)
- **We agree and will edit the language to reflect this.** We view this as an experiment, and we are looking to learn from it such that a robust method to monitor this population segment can be developed and implemented. (Scott Vanderkooi)
29. P.102: Project D has become multi-faceted, and as such, there are potential issues of over-handling fish, and permits that will need to be obtained for the taking of YOY fish for otolith

studies. Also, there is little clarification on what parties (agency personnel) will be responsible for what trips, and what the full justifications are for running an annual July trip. These details should be assessed and clarified at this stage of proposal development. (Janet Bair)

- We are concerned about over-handling, too. This draft represents a considerable change from the original, based on comments from FWS, NPS, and AGFD. We have proposed to minimize handling by reducing the use of trammel nets, and using hoop nets as much as possible – these are less stressful for the fish. In addition, we propose trammel nets will not be used when water temperature is above 16 degrees C (based on recent research). This is a conservative approach.

In addition, we propose ending sampling at Lava Chuar and Stephen Aisle, and half the remaining aggregations would be sampled only every other year.

This proposal will increase sampling only for a couple of years. The idea is to come up with more robust methods for assessing these aggregations, and then reduce sampling to a level dictated by the new method.

We are aware of the need for additional permitting, particularly for YOY humpback chub. There has been general agreement among fisheries scientists from cooperating agencies that the limited take of YOY is acceptable, based on the increased information we will obtain. In addition, any unintentional mortality will be taken advantage of, as always. Fin rays have some potential as a non-lethal alternative, but the scientist we work with on otoliths feels it is unlikely to work well, and that otoliths are the best way to obtain the data.

Justification for the July trip – The humpback chub population in Grand Canyon has been increasing over the last decade and it is likely that this increase has included an expansion of range beyond the identified aggregations. Determining if this has occurred seems particularly relevant given concerns expressed in the December 2011 Biological Opinion over the concentration of most humpback chub in Grand Canyon in and around the Little Colorado River. The last system-wide surveys of humpback chub occurred in the early to mid-1990s. We believe the addition of a system-wide survey is timely, as it will help determine the degree to which recent population increases have influenced the distribution of this species, help clarify the location and range of specific aggregations, and identify new areas that may have been colonized.

Regarding the comment requesting clarification of agency personnel responsible for what trips: This aggregation work has been a good collaborative project with FWS and USGS, and we intend that to continue. Roles and responsibilities will be assigned through mutual agreement. We will work with FWS on this. We see this as valuable collaboration. (Scott Vanderkooi)

### **Project E**

30. P. 115: We appreciate some references to the KA workshops. (Leslie James)

- No response necessary.

31. P. 119: Project Element E.1 July Little Colorado Marking: Overhandling of adult fish in the LCR: If hoopnets are to be deployed river-wide during July, this will involve a large by-catch of adult fish. It should be recognized that many of these fish will have been handled once already because of the primary mark-recapture activities conducted in April and May (Projects F.4.1 and F.4.2). Are these by-catch fish to be immediately released, or will they be processed? (Janet Bair)

- We, too, are concerned about affecting these fish negatively. We intend to handle any fish captured with utmost care, following standard methods agreed to for handling fish in Grand Canyon. During the summer months, any fish handled will be held in buckets with bubblers, and kept in the shade. We may also add salt to the water to help minimize osmotic stress. Initially, we plan to collect length data and scan for PIT tags for these fish. However, we will look to minimize any handling and release immediately if there are signs of stress. We have not done a lot of work this time of year; we will carefully monitor how it goes. (Scott Vanderkooi)

32. P. 119: July seems too early for initiating a river wide VIE marking effort. In July, most of the age-0 cohort will be very small (barely approaching ~50-60 mm at maximum, with the majority of the cohort still at <40 mm, or too small to capture in the hoopnets and VIE tag). This is why USFWS waits until September/October to conduct a river-wide VIE marking effort of the age-0 cohort. Even by September, many fish are barely >40-50 mm, but most are approaching ~80 mm. The larger the age-0 cohort is, the less mortality should be suffered from VIE tagging. So, we are not convinced of the necessity or prospects for success for a July VIE marking event. It would seem to put additional handling stress upon larger size classes of fish, but yield minimal results for the objective of the project, that is VIE tagging the age-0 cohort. (Janet Bair)

- The objective of this project is to estimate growth, survival, and movement of juvenile HBC in the LCR. Past data suggests there will be enough fish of the appropriate size to tag (showed a chart to document this). Preliminary work during the NSE project (2009-2011) found they were able to capture substantial numbers of VIE-tagable sized fish (>40 mm) in July. We are looking to tag only a moderate sample size to address the question of when they move from the LCR and the role of monsoon floods. The key reason to do it in July is to see the effects of the monsoon. We would miss this if we wait until the fall.

Jack: See Section 3.1 of this proposal, which describes the hypotheses and the management implications of whether the monsoon floods drive the populations. (Scott Vanderkooi)

33. P. 119: A July marking event could feasibly be expected to result in logistical overlap with the USFWS effort in July to collect age-1 fish for translocation to Chute Falls (and USFWS and NPS collection of the few age-0 fish that are available at that time of year for transport to Dexter). Moreover, since USFWS VIE marks riverwide in September and October, this will necessitate coordinating VIE tagging localities and colors so that we are able to run a mark-recap without confounding tagging occurring in July. (Janet Bair)

- We agree that coordination will be necessary and we intend to do this. We will also take advantage of existing trips and logistics, and minimize the number of helicopter flights. We have started doing this in our planning.

Regarding VIE tags, we agree. This has to be coordinated throughout the Colorado River ecosystem. GCMRC has developed a location and coloring scheme that would accommodate all proposed VIE marking for the next 6 years. (Scott Vanderkooi)

34. P. 119: The July project will rely upon the same equipment traditionally used for the fall mark-recapture effort. We are concerned with the potential for overuse and/or damage of equipment used at the Boulders, Coyote, and Salt camp during the summer months and how this may adversely affect the fall mark-recapture work. Accordingly, there needs to be a concerted effort by July field crews to ensure absolute quality control of all field equipment in anticipation of September field efforts, so as not to hamper or jeopardize the fall mark-recapture effort. (Janet Bair)

- We agree. Any time we use agency provided equipment, it should be used with care and properly maintained. We are using the taxpayer's dollars to fund this, and we need to be as cautious and careful as we can to avoid waste. We also need open communication with all parties using the camps at any time of year to make sure, if there are problems with equipment, that we communicate it and resolve it. (Scott Vanderkooi)

### **Project F**

35. P. 130: Project F.2.2 Rainbow Trout Early Life Stage Studies (RTELSS). This project is a level of scale and not sure if this is something that is needed annually. Changes in trout recruitment are detected during the standard Lees Ferry fall monitoring just not as instantaneous as (RTELSS). From the 2009 fish PEP recommendation:

“Monitoring age-0 trout habitat use and movement is not routinely needed because the electro-fishing survey provides a direct index of pre-recruit trout density. Similarly, redd counts are not needed because the electro-fishing survey provides a direct index of adult trout density. This program's strength is in evaluating the impacts of flow manipulations on early life history, and could be reinstated to for specific flow tests.”

Perhaps during HFE years BOR carryover funds could support this project. If funding were available, it would be good to fund this. (Bill Stewart)

- You are correct. The greatest value of this project is the quick means of evaluating effects of the various flows and flow regimes. HFEs are one example of those. This project also applies to flow-related efforts to manage trout population in Glen Canyon. This needs to be funded if those flows are going to happen. We propose to fund it from AMP funds in the current budget. (Scott Vanderkooi)

### **Project H**

36. P. 157: Project element H.1. AZGFD would need to know where this will be done due to recent whirling disease detection. (Bill Stewart)

- You are correct. We will keep you posted. (Scott Vanderkooi)
- This is one of the components of the MOA for live removal of the trout. It would be good to start discussions with tribes right away to look at other options as necessary. (Mike Yeatts)
  - We have been having discussions internally. This is new information and we are trying to determine what direction we are taking. We will move quickly to set up

tribal consultation meetings if this will change the live removal of trout. (Glen Knowles)

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### Policy Comments

38. During development of the DFCs, there was quite a bit of discussion about the 2004 priority questions. It is my understanding that there was generally consensus that these are “out of date”. I would suggest that they continue to remain as a reference point, but should not be key drivers (as should the DFCs) in the BWP process. For example, “why are the HBC not thriving”? could be reframed as “what is causing the population increase in HBC and what should we do to maintain and increase that level?” Two very different approaches and interpretations. (Leslie James)
- AMWG needs to make a policy call on this and acknowledge that the 2004 priorities have been replaced by the DOI priorities and DFCs, or not. Shane intends to suggest during his TWG chair report at the AMWG meeting that AMWG clarify the relationship between 2004 priorities, the 2011 DOI priority, the DFCs, and the 12 goal in the strategic plan. (Shane Capron)

### Additional Questions

39. Can Scott explain the Rainbow Trout Bioenergetics Model? (Vineetha Kartha)
- These models are the biological analog to the sediment mass-balance models that Dave Topping does. We are quantifying energetics – is the food the fish eat adequate to support all the things an animal needs to stay alive? They need energy for basic life processes (e.g., respiration, pumping blood, digestion), for activity (e.g., finding food, avoiding predators), and for growth both in terms of size and production of gametes. These types of models are a quantitative way of looking at that. We propose to develop a model for RBT in Glen Canyon, and look at how biological and environmental factors influence the growth potential of RBT. We will include water velocity, temperature, and competition. This is important in helping us understand why the prevalence of the big trout in Glen Canyon has declined from levels observed in the past. Is it possible for them to grow to large sizes under today’s conditions?

There are no plans to develop similar model for HBC under this workplan, as one already exists for HBC in Grand Canyon. The citation is Petersen and Paukert, *Trans. of the Amer. Fisheries Soc.* 134:960-974, 2005. (Scott Vanderkooi)