

Tom-

Please accept this note as comments on the Aspinall study plan, that are in addition to Brandon's input provided during development. The study plan is a very helpful step towards linking our management actions with biological response and highlights the need to develop some of the more basic life history understanding in order to do so.

I'm hoping these comments make sense presented in this form as opposed to edits to the document itself. If they do not, please feel free to call with any questions.

- Bony tail are largely omitted from consideration for study development. My understanding is that basic life history information remains mostly unknown at this time. Please consider inclusion of the highest priority life history investigations, or clearly indicate if the program is assuming that one of the other listed species may function as a surrogate regarding management actions.
- Is it worth considering fully connecting a subset of backwater habitats to the channel as opposed to active management of limited connection? I defer to Pat and other experts regarding the potential risks of creating further non-native source areas.
- One of the tables cites the desire to utilize the Green River study plan to inform this document but statements remain general. Can you be more specific about what studies or conclusions from the Green River work may help inform this study plan?
- Recognizing funding and other limitations, a few more specific recommendations for your consideration include:
  - o Backwaters
    - Establishment of at least a subset of site specific stage/discharge relationships at high priority backwater locations.
    - A complete inventory and aerial photo mapping of backwaters.
    - Add a study component that investigates creation and maintenance of these habitats.
  - o Sediment studies
    - In key spawning areas, add sediment facies mapping, buried chains, painted rock, or other monitoring protocols to quantify sediment characteristics and how managed flows affect these characteristics with respect to species life history needs.
    - Change channel mapping frequency from the suggested 10 to 5 yrs. A 10 year window may miss too much change in alluvial reaches. Also consider combining aerial photography with collection of Lidar topographic data, and most current veg mapping technology (may still be lidar). My point is accomplish cost savings with more comprehensive data collection in on flight. Consider addition of water temperature mapping to identify temperature refugia?
    - It is unclear what guidance you expect to incorporate from study 85f. please clarify.

I also want to offer general thoughts that apply to this study plan and its ties to the RIPRAP table, and also to the RIPRAP table itself. By nature, some items of the RIPRAP will likely always be general however, technical studies cited there might benefit from more specificity. Some study descriptions proposed in the study plan for inclusion in the RIPRAP are already well focused, but others remain much more general and run the risk of study scopes that may miss

the target of the program need. Because funding is becoming ever more limiting, I encourage whatever additional thought the authors may provide now to formulate study descriptions for the most targeted and rapid route to recovery. You know my program tenure is short and there may be other means the program uses to further refine study scopes. If so, then great. If not, please considering focusing these studies now while the authors are engaged in developing the document. Geographic extent (i.e. river reach) over which studies will occur is one easier example to provide here without diving into individual study detail.

Similarly, the proposed RIPRAP item to “integrate and synthesize information to evaluate and recommend necessary revision of the proposed action” is very encouraging to see but is also more general than it might be. It might be more useful to clarify what information sources you intend to synthesize. Although policy elements show up from time to time in this technical document, it would be helpful for you to clarify if the intent is to include information in this synthesis from the annual flow and operations reports referenced in this study plan, the report on Dolores River flow management, or some other body of information you have in mind.

Thanks, Tom, for the opportunity to comment and we very much appreciate the authors’ efforts on this.