

Biology Committee Webinar Summary, November 7th, 2018

In attendance: Melissa Trammell (chair), Paul Badame, Dave Speas, Harry Crockett, Pete Cavalli, Dale Ryden, Tom Pitts, Craig Ellsworth; Absent: Environmental Representative, CREDA

Interested Parties: Tom Chart, Kevin McAbee, Julie Stahli, Kevin Bestgen, Mike Mills, Cheyenne Owens, Tildon Jones, Don Anderson, Matt Breen, Jojo La, Katie Creighton

Comments submitted by: Kevin Bestgen, Pete Cavalli and Dave Speas.

CONVENED: 8:36 am

1. Introductions and review/modify agenda. Melissa asked Craig Ellsworth to introduce himself as the newest member of the BC. Craig is the new representative from WAPA. He has worked extensively with the Glen Canyon Dam Adaptive Management Program as a fisheries biologist including substantial work with endangered fish. He is looking forward to getting to know the upper basin better. Jerry Wilhite remains at WAPA, just in a different role. No additions were made to the agenda but times were changed as appears below.
2. Program Director's update
 - a. New staff - Tom Chart said that Tildon Jones has joined the PDO as of mid-October, but will remain physically located in the Vernal office. Tildon is well known for his excellent work as a supervisory biologist and the PDO is excited to have him on board. Tildon will be focusing on floodplains, nonnative fish removal (in-river portions), monitoring for pikeminnow and early life stage monitoring occurring throughout the basin. He will also take the lead on the pikeminnow SSA and subsequent 5-year review. Cheyenne Owens also joined the PDO in mid-October. She is an intern who has worked at the Tech Center and hatchery in Bozeman, MT and in Creston working for both ES and the hatchery. Cheyenne earned her masters at CSU working on Snake River cutthroat trout. She will be with us for a year focusing on bonytail, culminating with a 5-year review. Cheyenne will assist with the hatchery and propagation program element and has shown an interest in outreach as well. Tom Pitts asked if Tildon will be charged with biological issues along all rivers. He encouraged Tildon to spend some time in Grand Junction with the water users and other partners in the area. Tom noted that Tildon is likely to be involved in Colorado River issues, but Don has also

been focused in the area. Tom Chart said the PDO has planned a weeklong staff meeting next week to clarify staff responsibilities. >Tom Pitts has requested an outline of staff activities after that meeting.

- b. RBS 5-year review, schedule for proposed rule and potential 4(d) rule - Fish and Wildlife Service Regional Director Noreen Walsh has decided to pursue a proposed downlisting action for razorback sucker. Julie Stahli was the lead for the [SSA](#) and [5-year review](#). She will take the lead on the proposed rule as well, going through regional office review by April of 2019. A 4(d) rule will likely be included as part of that proposed rule.
- c. HBC Proposed Downlisting Rule and associated 4(d) rule - Kevin reviewed the proposed changes in ESA implementation issued by FWS that was published in July. Before that time, all newly threatened species automatically received all protections that the species garnered under endangered status (referred to as the “blanket 4(d) rule”). Over the last few years, species-specific protections have been implemented for newly threatened species; the need for species-specific protections was therefore required for humpback chub. Because the proposed changes were published during writing of the humpback chub proposed downlisting, the 4(d) rule had to be developed and appended quickly. Moving forward, 4(d) rules will be included in our proposed downlisting actions. Kevin looked to the SSA and the activities recommended for the conservation of the species and developed the 4(d) rule to support and ease the regulatory burden of those conservation actions. Five broad topics were included (exempted from take restrictions) in the 4(d) rule. The 5 actions include: take associated with actions needed to maintain or develop refuge populations; take associated with expanding the range of the species through translocations or stocking; incidental take associated with nonnative fish removal; take resulting from catch and release angling (either during angling for other species or as part of a new humpback chub fishery outside of the current 6 populations); and take associated with chemical treatments occurring in support of humpback chub conservation (e.g. reservoir reclamation, Grand Canyon treatments). Descriptions, reasonable care, and requirements to implement these actions are outlined in the 4(d) rule. After publishing in the Federal Register, comments are welcome and encouraged from program partners. Thanks to Cheyenne for her work in providing research into existing regulations of these topics. Melissa asked if the 4(d) rule could be distributed to the program partners. Kevin said it is an internal FWS document and therefore will only be visible when it publishes in the Federal Register. It has received Solicitor review and we hope it will be published before the DC trip.
- d. Annual report deadline is Friday, November 16th. Please submit reports to Kevin McAbee (copying Tom Chart), who will distribute to coordinators once the PDO has decided on leads.

- e. Post-2023 next steps - Tom Chart said that through the winter months, the PDO will be working with the San Juan River office to assess activities needed to continue after 2023. The program has been working on status of the species now and likely status in 2023. Tom anticipates small technical work groups (Upper Colorado and in the San Juan program) being assembled this winter to review ongoing actions and to develop a recommendation on necessary post-2023 activities.
 - f. Sufficient Progress - Tom thanked all who provided comments on Sufficient Progress and associated PBOs. The next step is to convene FWS staff across both FWCOs and ES to solicit their input and develop a Sufficient Progress conclusion. The documents will be distributed as a courtesy copy to the Management Committee as we seek USFWS - Regional Director approval.
3. Draft Flow Recommendations for Endangered Fishes of the White River, Colorado and Utah - Don sent the draft document out on September 10th to the BC, WAC and White River Planning Team. October 19th was the deadline for comments. Don has received comments from CWCB, CPW, Tom Pitts for Water Users, Dave Speas at BOR and Alden Vanden Brink from Rio Blanco Water Conservancy. Don thanked Tildon Jones and Matt Breen for their assistance in describing biological conditions as well as the flow modeling that was incorporated. The intent of updating the document was to include the current science as well as the inherent uncertainties in that science. The document includes both peak and base flow recommendations under varying flow conditions. Don praised the value of the comments that were submitted, including additional field data that may help describe conditions in the river. In his comments, Tom Pitts highlighted some areas that may be overstating the best available information and implications of that information. CPW expressed concern around low flow recommendations during low flow years. The document has highlighted that the White River supports a native fish community and therefore the flows currently in the system should be protected, which some commenters recommend needs further data to support. The PDO has viewed this as a process to develop and approve White River flow recommendations to assess the impacts of future development as the White River Management Plan is being developed. Tom Pitts believes finalization of the flow recommendations is premature until a PBO and assessments of likely future development have been finalized. Uncertainty remains regarding future demand in the White River. Water development has occurred for human needs, but projected needs for future energy development range from 0-110,000 af per year. Proposals for a new reservoir near Rangely range from 40,000-90,000 af per year, which creates additional uncertainty around how flows would be affected. Tom Pitts would like to see a more iterative process with further work occurring on the Management Plan before flow recommendations are finalized. Tom also noted that the White interacts with the Green River causing additional uncertainty. Dave Speas supports

getting additional information into the management planning process, but also noted that the planning process for the White River has been occurring for over 10 years and each time the conversation occurs, the base flow recommendations decline. Dave believed that the flow recommendations should outline what supports the endangered fish and encouraged locking that in if the data are supported. Dave noted flow recommendations on other systems (such as the Price) have been based on what supports the biology. Harry, Melissa and Pete supported Dave's position. Melissa believes the first step is to finalize flow recommendations that are supportive of the fish before the management plan is finalized, even if the process is iterative. Dale said decisions made by the Ecological Services office about development on the Colorado are based on the flow recommendations in place and supported the development of flow recommendations first. Don said there is a section in the report regarding anticipated implementation, recognizing that flow recommendations may not always be able to be met as new development occurs. Should that occur, the document recommends identifying and implementing off-setting mechanisms for those impacts. The document recognizes that water development is likely to affect flows in the river and the goal is to be able to measure those impacts. Jojo La asked what the process is for finalizing these flow recommendations. Don said he will continue to work through comments with those that have provided comments. Don plans to hold a webinar to provide an opportunity to comment on proposed changes and provide technical committee approval in ~January. All interested parties are welcome on that webinar including participants from the BC, WAC and MC. Management Committee approval will follow. Don will accept additional comments to be considered in the next draft by November 16th. Don will reach out to TNC again to see if they wish to submit comments.

4. Updates from Assignment list

- a. Stirrup update - Dave described the Stirrup wetland and noted a small group has been working to provide recommendations to alter the wetland to be able to manage the system. Dave will continue to work on this project, but welcomed Tildon as the PDO's representative on the project. Tildon has agreed to assume coordination of the project moving forward. Tildon reiterated that the original design caused some concerns about being able to completely drain the wetland, and despite improvements in the latest design, approximately 2 ft of water would remain behind the gate at full drain. The last group call focused on positions of the screens and the fish kettle. The current estimate for construction is \$518,000. The team expects revised cost estimates and a revised design before the BC meeting in January. BOR crews need at least a month to complete the project, which they do not have available until at least 2020. BLM is currently working on NEPA compliance, which will take most of 2019. BLM has requested a presentation from the Program, which is scheduled for late November. One of the

primary advantages of the Stirrup is substantial depth in the wetland without dredging (8 ft, which would likely fall to 5-6 ft after summer evaporation). The depth can support higher water quality, suppress cattails, and may potentially overwinter fish. The design supports connection with the river at about 3,000 cfs and is small, which should facilitate management. The major drawback is the inability to drain the wetland completely, but one solution may be to lower the fish kettle to an elevation lower than the wetland itself, where water could be pumped out to facilitate draining (~48 hours of pumping). Pete asked if the depression of the kettle would encourage filling from groundwater. Tildon said the kettle would be made of concrete, but could potentially fill through cracks. Dave said some standing water would be likely; Scott Winterton is trying to outline how significant that would be. It's also possible that the lower kettle would encourage sedimentation in the river canal next to the gate. A ramp is being incorporated into the design plans to allow access for a bobcat to remove sediment from the kettle. Sedimentation in that channel has been documented by UDWR (Trina Hedrick) and Argonne in relation to connection elevations. Dave said the draining occurring in the fall would likely sluice out some of the sediment. Melissa noted the need for additional managed wetlands and supported the project assuming the engineers believe it can work. Dave agreed, noting that adding this to the system supports a variety of actions during the next few years and post-2023. Tildon added that 2018 was a very dry year and having another wetland available is important to maintain consistent production of razorbacks as the wetlands we currently have commonly go offline periodically or are unavailable for connections in low water years. Pete asked if the ownership issues have been resolved. Tildon said those problems have been generally addressed and he will continue to work with BLM to provide information about how the logistics of construction would affect the landscape. Paul Badame concurred and noted that Forestry, Fire and State Lands would not need to be involved in the NEPA process. Tildon said all of the wetlands on the Green River have pros and cons, but Stirrup has the best pro to con ratio. Matt Breen supported the choice and said it is one of the easiest wetlands in the system to manage because of its size and orientation. Kevin McAbee said the PDO supports the project. Paul reminded the group that action on the Stirrup does not preclude action on other wetlands, only that Stirrup was put at the top of the list. Tom Chart asked whether the lowering of the kettle was conceptual or whether the design was fairly concrete. Dave and Tildon both think Scott Winterton understands the concern and believes it can be addressed. Pete requested an assessment of how groundwater would affect the wetland itself (and whether drainage would actually occur under higher base flows). Tildon said the wetland is currently dry because of lack of spring connection and a hot-dry summer - no evidence of groundwater

is currently occurring under 2000-2600 cfs base flow conditions. >Tildon/Dave will come back to the BC with final designs at the January meeting for approval.

- b. Matheson update - Paul Badame said ground was broken at Matheson on October 31st for Phase I. Phase I includes excavation of the wetland, the channel into the wetland and some of the control structure (including a gate). Construction is likely to take approximately 90 days. Construction will provide wetland connection at lower flows. UDWR habitat staff are excited about more water for waterfowl, and assessment of larval fish entrainment will also begin (probably under Project 160) to see if larvae can be entrained in the linear pond. Phases II (connection of spring-fed pipe to pond to provide supplemental water) and III (Mill Creek reconstruction to provide additional water) will be dependent on the results of those larval studies. Phase I is being funded by TNC, Utah's Watershed Restoration Initiative and UDNRs ESMF. Another \$700,000 is needed to complete the project as designed. UDOT may be another potential funding source via mitigation for widening Highway 191. An additional \$800,000 would be needed to re-route Mill Creek to provide supplemental water into the preserve. The Moab Area Watershed Partnership is interested in supporting the Mill Creek diversion, which is also supported by TNC because of other benefits unrelated to native fish. Melissa asked if committee members supported action on this site, since prioritization of wetlands on the Colorado River hasn't quite been completed, but so far a better option for providing wetland habitat hasn't been identified. Tom Chart recognized that the PDO has not had the staff time to adequately address floodplain prioritization, but he felt they were in a better position now with Tildon coming on board. Tom supported delaying the decision on program funding until the PDO has the chance to frame the decision in that basin wide context. >Tildon will bring this back to the BC as appropriate. >Paul recommended adding a field trip to Matheson to the Researcher's meeting/BC in January. Melissa asked if there are deadlines that need to be considered. Katie explained that TNC put funding in place for Phase I under the assumption that others would assist in Phase II and Phase III efforts and promised updates by the beginning of 2019. Linda Wittham (TNC in Moab) is the primary contact at TNC. Paul recommended applying for additional funds from the Watershed Restoration Initiative. Katie will pursue those funds again this year.
- c. Standardization of Electrofishing Fleet - Kevin McAbee reviewed the discussion during the last meeting about the finalization of the report on electrofishing standardization. The BC highlighted a few ideas to continue collaboration with Pat around standardization of equipment. Pat said the SOP is developed based on specific configurations and even small changes in those configurations would change the recommendations in the SOP and declined to continue work on this effort. The SOP is currently in effect and has been posted on the website. Tildon

recommended changes in configuration on rafts to optimize field size and Pat's belief is that would essentially restart the process on standardization. Tildon believes we have effectively reduced the size of the field when using a raft and was hoping for additional guidance on how to increase the field size without harming the fish (e.g. what changes would support larger fields). Tom Chart said further efforts on this will likely require additional expertise, potentially from NCTC or other experts. The PDO will reevaluate as opportunities become available to assess our protocols, especially in relation to rafts. The committee reiterated discontinuation of information collection around settings, which may recommence if opportunities arise to reevaluate.

- d. Additional CPM broodstock collections - cancelled for Fall of 2018. Based on various complications (e.g. our FY19 funding uncertainty), Southwestern Native ARRC was not available to schedule a collection trip in a timeframe that we felt would yield good results. Efforts could resume in 2019 as appropriate.
5. GREAT Update - Tom Chart reviewed that the GREAT report has 5 chapters: Chapter 1 - introduction, 2 - hydrology and temperature and success with meeting those recommendations, 3 - new information about endangered fish biology / ecology, 4 - what we've learned under The Green River Study Plan and other investigations, 5 - synthesis of all that information as the basis for our future recommendations. The GREAT met in Denver to review Chapter 5 and all the issues brought up by the team members. The issues included the differences between Reach 2 and Reach 3, the different priority species in different years, the decision trees that would be utilized by the Flaming Gorge Technical Working Group and other individual suggestions. The GREAT made it through the uncertainties section and is scheduled to meet by phone to finalize comments on Chapter 5. A draft will likely be available for technical committee review by the end of this calendar year. Another issue that has arisen is how revised flow recommendations are presented in relation to NEPA: are recommendations meant to become standard operating procedures or should they be implemented in an experimental mode? That question will be brought to the Management Committee on December 19th and Tom recommended that interested BC members join in that discussion. Melissa said discussions were held with the GREAT about whether the Spike Flow Study Plan and the Physical Habitat Monitoring Plan should be included in the GREAT or stand-alone documents - the conclusion was that they would be stand-alone documents approved independently of the GREAT report. Dave asked if the study plan went through traditional review. Tom Chart said the study plan was assessed by the GREAT and distributed to the BC in October of 2017, and has received a significant amount of input. Kevin Bestgen received comments from at least 6 reviewers from multiple agencies.
- a. SMB Flow Spike Study Plan - The notion of using flow spikes to control smallmouth bass was developed to determine alternative methods to mechanical

removal for removing nonnative fish, without harming native species. Smallmouth bass construct a loose nest on the substrate, which is guarded by a male bass. The eggs are either not adhesive or are minimally adhesive. Both the eggs and young fish are susceptible to mortality after nest abandonment by adults, which may occur because of changes in temperature, flow or turbidity. Contrarily, native fish deposit eggs deep in gravel in fast flowing water, which are very adhesive and therefore far less affected by sudden increases in flow. Flow is controllable in the Green River system via releases from Flaming Gorge Reservoir, which could target smallmouth bass seasonally. Flow spikes for smallmouth bass suppression would occur after spring releases to increase wetland connections to the Green River to support razorback sucker in the spring, and before flow management to maintain backwater nursery habitat and recruitment for Colorado pikeminnow in the summer. Otoliths have been used to assess hatch dates for smallmouth bass under varying flow and temperature conditions. Flow spikes may be appropriate in moderate to low flow years (70% of years) once spawning has been confirmed by monitoring (e.g. adequate backwater habitat to encourage spawning, timing etc). Once spawning begins, spawning lasts about 28 days so once a decision occurs to create a flow-spike, a 3-day duration at full power-plant level (4500 cfs) could affect Lodore Canyon down to Rainbow and Island parks in Reach 2. Specific timing should target the middle of the spawning period, which would affect early hatches before they grow large enough to survive. Flow-spikes later in the year might impact Colorado pikeminnow larvae drifting downstream from the Yampa River into the Green River. Post-flow-spike monitoring would assess effects on physical habitat and biological conditions (e.g. are bass larvae still present, do adult bass remain and spawn again?). In 2015, a rainstorm along the Yampa created a flow event with substantial turbidity in the middle of bass spawning season causing severe reductions in young smallmouth bass abundance. Survival of young did occur for those spawned early and those spawned after the flow spike. Data from the Dolores River are pending that may show similar results. Compensatory effects have been raised as a concern, where bass might spawn again to recover from a lost nest. The earliest spawned bass are most likely to survive throughout the winters, so repeat spawning by bass is likely to be less successful over the long term. Tom Pitts asked if the flow spikes are incorporated in the current ROD. Kevin Bestgen noted they would be considered an experimental activity. Going outside the 4500 cfs boundary may require additional NEPA consultation. LTSP, altered base flows and flow spikes implemented on a permanent basis would likely have to undergo further NEPA review. Tom asked what effects a flow spike would have on trout and trout fishing. Kevin Bestgen said that flows fluctuate below Flaming Gorge all the time, which may have a negative impact on trout as

they need to adapt to changing flow conditions. Argonne was unable to show a bioenergetic effect on the trout from regular twice-daily power fluctuations, but such flows may affect fishing success. A flow spike may have a similar effect. Discussions with guides and other affected parties are ongoing. Ideally, guides would prefer scheduling of a flow spike in Fall so they can ensure they do not have clients on the river during that time. An autumn flow spike would be ineffectual because no young smallmouth bass susceptible to high flows are present; they have grown substantially by then. Tom Chart supported the effort in service of the endangered fish and encouraged proposing these kinds of actions based on our current scientific understanding. Melissa asked if additional Scopes of Work (SOW) would be needed for pre, during and post spike monitoring. Kevin Bestgen said new SOWs would be needed (at least for a few years), but CSU would attempt to capitalize on current efforts to economize. Considerable field work would likely be necessary during a very specific time period to properly document the effects on both habitat and biological outcomes. Dave expressed concerns about including average flow years in the proposal and that detecting effects would be easier during lower flow conditions. Bass reproduction is also known to be a larger problem in low flow conditions. Kevin Bestgen said he is comfortable adding average flow conditions because the habitat utilized by bass during average flow years is different, often in side channels that would be significantly affected by the flow spikes. Average years would likely have larger effects in those areas and consistent effort over multiple years is important to have population level effects. Dave reminded the BC that BOR may need assistance in shifting focus in a SOW to accommodate these kinds of efforts based on environmental conditions. Kevin McAbee agreed and asked if we can plan on switching between managing flooded wetlands and spike flows based on flow conditions (e.g. during low flow conditions not very many wetlands connect which would be the same years when spike flow monitoring might increase). Pete supported the use of flow spikes to limit bass on a population level. Dale expressed a desire for the ability to replicate the conditions over multiple rivers to facilitate measurement of effects and is concerned that even though bass may be dramatically affected, the ability to measure it may be limited. Dale agreed flow spikes were important to try, and to try as soon as possible with post-2023 pending. Kevin McAbee reviewed his discussions of the importance of flow spikes in the context of post-2023. He said that most in the Program Office consider the actions in our workplan to be essential to continue, but this is one example of how successful alternatives may dramatically impact our need to mechanically remove nonnatives in that reach. Paul expressed support for the effort and is only concerned about limited success because increases in turbidity will not accompany the increases in flow. Melissa said the flow spike may

mobilize sand in the system where available. Kevin Bestgen anticipates an increase in turbidity, but acknowledges it will likely be lower than a natural rainstorm. The BC approved the report as written, pending editorial revisions suggested by Dave Speas. >Kevin Besten will finalize and send to the PDO for posting and distribution (*done 11/8/18*). Kevin will develop a SOW to have in place should appropriate environmental conditions develop. Dave encouraged efforts to assess whether this effort could occur by prioritizing efforts within the current budgets. Tom and Dave both reiterated the need to reduce spending to align with available funds.

- b. Physical Habitat Monitoring Plan - The NPS is interested in monitoring physical habitat and vegetation response to elevated base flows and spike flows. Melissa said NPS is supportive of manipulating flows to support endangered fish, but they have concerns that it will narrow channels by encouraging establishment of vegetation. Monitoring the effects would include sediment monitoring gages (currently in place), site based measurements and remote sensing through the NPS National Inventory and Monitoring Program (NIMP). Currently, primary sites are in Dinosaur NM and Canyonlands NP where the effects of vegetation on former active channel features have been documented resulting in reduced channel complexity. Melissa noted there is a lot of land between NPS properties where monitoring should be occurring, especially in the Jensen-Ouray reach. Melissa recommends the use of the established NIMP methods, which allow for assessment at fine and large scales, evaluating scour and deposition at various flows. NPS has looked at historic photographs and compared them to 2011 conditions proving simplified channels and increasing vegetation establishment, but the methods used were labor intensive. NASA has worked with NPS to use remote sensing capabilities to assist in environmental efforts. A project was funded to use their modeling capabilities to assess whether or not NASA Earth observations could detect changes and monitor into the future. Pete asked if the study could document the effect of Tamarisk beetle. Melissa said that reductions in vegetation have been seen both from the Tamarisk beetle and the high flows that occurred in 2011. NASA results concurred with the on-the-ground data which documented decreasing water surface area and increasing vegetation. Before 2010, only 30 m² resolution was available, now 10 m² resolution is available. An additional classroom session is available to refine the tool, which Melissa plans to capitalize on. The tool cannot determine mechanisms of change and can't detect year to year establishment or small vegetation changes, but allows evaluation of changes over a reachwide scale. A white paper is available outlining the concerns and recommendations for future tracking which was sent to BC members in April. The white paper includes monitoring recommendations. >Melissa is planning on developing a monitoring plan and associated 20-21 SOW outlining sites, methods

etc and welcomes recommendations. NPS feels it is important to measure baseline conditions before experimental flows are implemented, but Melissa acknowledges this may not be possible. Melissa [shared a video](#) developed by the NASA students. Melissa will share the interactive tool and associated documentation with the Program. Tom Chart said the dataset started in 1984, and asked whether the starting point may be based off of a significant scour event. Melissa said that could be investigated.

6. Bonytail stocking/hatchery guidance discussion - Julie Stahl emphasized the need to evaluate bonytail stocking success using all existing data and outside information. Julie and Cheyenne Owens looked back at the Revised Integrated Stocking Plan (ISP) to highlight some issues that warrant further investigation.
 - a. Julie reviewed the 2018 stocking events
 - Wahweap - stocked in April - Green River in Green River, UT (3449 fish), Dolores (3484 fish), Green River at Mineral Bottom (3431 fish).
 - ~35,000 ~100mm untagged bonytail into Lake Powell at the Hite Bridge
 - CPW - Salt Creek (763 fish), Colorado @ Debeque (2504 fish), Yampa @ Deerlodge (2592 fish)
 - Randlett - White River at Enron (1828 fish), Leota 10 (506 fish), Green River at RM 262.6 (2058 fish), at RM 258 (1527 fish), at RM 120.0 (2883 fish), at RM 329.5 (2145 fish)
 - Grand Valley - Gunnison River (2800 fish), Colorado River at RM 157.1 (3423 fish), at RM 166.7 (4986 fish), at RM 183.6 (898 fish), at RM 240.7 (5283 fish)

Because of hydrology and recommendation locations, at the end of the year the hatcheries had few options for bonytail stocking locations. In addition, earlier stockings in L-10 were not successful because of how little water remained in the wetland by the end of the summer.

- b. Potential action/discussion items - Actions in the ISP present concepts to investigate, but suggest waiting 5 years; Should we accelerate that time and investigate certain topics. A summary document will be sent to the BC with the meeting summary. Potential actions to take moving forward:
 - i. Evaluation of Stocking
 1. Timing
 2. Location
 3. Densities (especially in wetlands)
 - ii. Food study
 - iii. Flow training
 - iv. Predator avoidance

- v. Over winter survival
 - vi. Genetic integrity
 - vii. Data around care and stocking conditions - create datasheets for distributions
 - viii. Stress / handling effects
 - ix. Keep our eyes open for opportunities to use predator-free ponds as available (e.g. pond isolated by low lake levels in tributary washes of Lake Powell)
- c. Options for a food study - Dale described the condition of bonytail in his hatchery as they were dissected during HCP, which were full of fatty material around their internal organs. Cheyenne investigated bonytail HCP data, including liver lipids. Although there is variability of liver lipid levels across species, high fat diets, nutrient deficiencies, and improper food storage can lead to fatty liver pathology. This can lead to anemia, immune suppression, etc. Cyprinids typically don't store fat in livers (i.e. common carp) and improper diet can lead to elevated lipid content. Typical common carp feed (cyprinid) and razorback sucker feed do not have similar ratios of protein, fat, and carbohydrates. Lower trophic level fish use carbs efficiently, which typically lead to sensitivity in dietary lipid levels. Previous studies on bonytail feed did not document differences in fish response, but the feeds weren't different from each other in key nutrient ratios. The fatty liver analyses from the Bozeman FHC indicated bonytail had livers comprised of 21-44% fat. Should only be ~10%, so this is way out of range. Upon review, Gibson Gaylord suggested further research was prudent. The Fish Health Center provided some suggestions for how to move forward, including recommending a full diet study. They can run up to 14 diets at once in Bozeman. Hatcheries could also experiment with catfish feed as an option. Melissa asked what species are most analogous in dietary needs - Cheyenne mentioned catfish, tilapia, and carp. There are other Gila species being raised in certain locations, such as roundtail in Arizona and humpback at SNARRC. Julie suggested a sub-group to discuss and sought support to continue investigating the feasibility/appropriateness of a food study. Dale (and Dave Schnoor), Paul (and Zane), Harry (and Mumma), Pete volunteered. Melissa suggested SNARRC as well. >Julie and Cheyenne will convene the group over the next few months and determine next steps.
7. Updates on nonnative coordination meetings, and researcher's meeting - Kevin McAbee said that revisions to nonnative fish scopes of work have been occurring in Nov-Dec. Sampling in 2018 occurred as expected based on flow conditions and Kevin is not expecting significant changes to scopes of work during the upcoming work planning process. Kevin suggests not having the meeting again this year pending approval of the BC, but does recommend revisiting it in the future (potentially in 2019). The committee

expressed support for delay until 2019. Melissa encouraged a more long-term focus for the next meeting in relation to post-2023. >Kevin will reach out to the PIs to determine optimal dates for the winter/spring of 2019-2020. Paul Badame reminded the group that the Researcher's Meeting will occur in Moab on January 15-16. It will likely occur at the Moab Valley Inn, which has both meeting rooms and rooms for attendees at the same location. Kevin offered PDO support as desired by UDWR. Dave asked if there was any interest in convening a group around how to utilize PIT tag data in conjunction with other sampling data. Interest was expressed in that topic as well as other subgroup meetings that may occur in conjunction with the BC. The BC added a placeholder to add the 18th for a possible addition to the January meeting, the PDO will develop a proposed agenda during work planning next week. If people have additional suggestions on topics for side meetings, please send them to the PDO. The proposed discussion centered on geomorphology is unlikely to occur during this Researcher's meeting but is still pending. >PDO will send out a call for papers soon (*done*).

8. Reports due list was reviewed and amended.
9. Consent item: Review and approve September Biology Committee webinar summary which was sent with the agenda. The BC approved the summary. >Julie will finalize and post.
10. Next meeting scheduled to occur in conjunction with the Researchers' Meeting (January 15-16) - January 17-18.

ADJOURNED: 1:58 pm

Attachment 1: Assignments

The order of some assignments has been changed to group similar items together. For earlier history of items preceded by an ampersand “&”, please see previous meeting summaries.

1. Humpback Chub (refugia/broodstock development / genetics)

- The Program will develop an action plan for establishing refugia for humpback chub (avoiding getting bogged down in genetic analysis) and continue to add new wild fish to hatcheries. Mike Roberts has recommended building in limiting factor/life history studies to better understand what’s going on in the system that’s affecting humpback chub populations. After Wade’s report is received, a workshop should be held to include discussion of when and where fish would be stocked. Tom Chart recommended outlining questions for a workshop, conducting the workshop, and then finalizing the action plan. *10/27/14: Reclamation awarded contract to SNARRC for analyzing remaining fin clips and completing report (including lower basin data). 1/15/15: data on upper basin chubs will be written up within about a year. The subgroup developed a list of questions for Wade to address (Tom Czaplá sent to BC 1/21/15); Melissa Trammell will find and send the plan development proposal document to Tom Czaplá by January 21 and Tom will send it to Wade with a courtesy copy to the Biology Committee and Kevin Bestgen. (Done). Wade will revise the scope of work (done). Additional work pending results from Wade. 5/23/17: Wade says Sandra, who did the testing, has left the office so the Westwater samples will not be analyzed for another year. Tom Czaplá asked if the Committee would like the report now without Westwater samples, or in a year to include the Westwater samples. Dale is concerned that the Westwater data will get lost if we do not wait to include it in the final report. The Committee agreed we want the Westwater data included in the analysis; meanwhile, Tom will distribute the working report (if Wade agrees) to the BC to provide an update. Tom Czaplá said we will wait to figure out what to do with the fish at FWS_RH until we get the white paper on Yampa River transfer. ● Tom Czaplá will follow up with Wade Wilson and get recommendations on securing additional fish for broodstock (e.g. from Deso/Gray). Wade recommends more broodstock (minimum of 50) from Deso to support the stock at Randlett of 10-13 fish. Pete asked what we would do with these fish. The committee isn’t sure, but it will be affected by the white paper and results of the final report. Sandra had recommended a single broodstock from the Upper Basin. 9/17/18: Dale has not collected wild fish this year, they were waiting for temperatures to cool off, but with funding concerns, Dale thinks collection this fall is unlikely. Dale asked if HBC are downlisted, do we need to retain refuge populations? Tom Chart said downlisting would not negate the need to keep hatchery stock. Tom said we still need to figure out what fish are appropriate for Yampa Canyon, which will affect broodstock decisions. Melissa said the fish originally available from the Grand Canyon are no longer available; they were stocked into Bright Angel Creek*

in the Grand Canyon. The group will reconvene. Kevin McAbee reiterated the importance of these actions for HBC which will gain important side-boards during the recovery planning process.

- Program needs to continue to evaluate fish for Yampa Canyon replacement
2. The Committee endorsed an experiment to tag smaller hatchery razorback and bonytail (for fish coming out of floodplains). Tom Czapla will investigate which hatchery could do this. Tom Czapla will check the BO written for scientific take permits to see if any change in permitting would be required. *1/13/16: Matt Fry is experimenting with tagging smaller fish and will document this work for the Committee in the Ouray NFH 2016 annual report. Tom Czapla will make sure this has been written up. Melissa Trammell said Dave Ward has done a great deal of work on this and will send references to Tom Czapla. Dale Ryden and others emphasized that experienced hatchery personnel likely will always be able to tag smaller fish than seasonal technicians in the field. Tom Czapla will compile information he's received and provide it to the Committee in advance of the May webinar. 5/23: Tom Czapla will request write-up from Matt Fry. 7/14/17: In progress; 10/12/17; Tom Czapla sent draft to the Committee for review on September 29; to be discussed in January 2018. So far we received comments from Pete Cavalli and Dale Ryden, are any other BC members planning on sending comments? 1/25/17: Discussed at the January meeting; Tildon Jones will assist Matt Fry in completing the report. Any additional comments should be submitted by Feb. 15. 11/8/17: Cheyenne will assist Matt in the development of this document as Tildon assumes other responsibilities.*
 3. Biology Committee members can share any thoughts/comments on proposed graduate research projects back to the Committee and the Committee will track as a future agenda item to determine any next steps or specific projects we want to focus on. *3/7/17: Although FY18 budgets appear constrained, we can always put these on a contingency list and keep our eyes out for other funding sources.*
 4. Floodplain follow-up assignments:
 - a. The Program Director's Office will discuss terms of the Escalante wetland and Lamb property leases with Ouray NWR (Dan Schaad, Sonja Jahrsdoerfer, and Andrew Pettibone) to ensure the Program really benefits from them. Tildon noted that the easements may be protecting these floodplains from other development. Tildon said there are two easements being proposed to be open to oil and gas leasing though the BLM - Pariette and Escalante Ranch. Pending.
 - b. PDO will develop a prioritization strategy for both the Colorado and the Green by the end of August and will schedule a call (Sept-Oct) to continue discussion. *10/27/17 - Draft discussed by Committee; comments due within two weeks to the*

Program office. Tom Chart will then take it back to Brent and Ryan and see about next steps. 1/25/18: Prioritization now dependent on elevation surveys and larval information. 9/17/18: Tom expressed support for moving forward with the Stirrup on the Green River and noted the Matheson may be the best option on the Colorado River. The PDO expects to make progress on this issue as soon as we get additional staff online.

- c. *Matheson wetland consideration - 9/17/18: Paul said excavation of the inlet channel was continuing and alterations were being made to the design to determine the inlet structure. 11/8/18: Tildon has assumed prioritization of wetlands as part of new duties and will bring discussions of Matheson funding back to the BC as appropriate.*
 - d. *BLM concerns regarding ownership of Stirrup wetland. Paul Badame will bring this information to Todd Adams (Utah rep on MC) to discuss in water resources at the UDNR level. 4/3/18: Jerrad Goodell will investigate and provide an answer in April. 7/17/18 – Paul Badame provided an email from Jerrad Goodell to the BC, indicating that the issue is a BLM manager and Utah FFSL need to agree on the location of the high water mark. Dave Speas will send out design/cost information on the Stirrup wetland once attained. 9/17/18: Dave recently learned that construction crews are not available to conduct this in spring of 2019 and is only available to construct in spring of 2020 if we can commit to their schedule. Design has also been delayed because of work on higher priorities. Dave will host a phone call towards the end of October to move this effort forward. Dave recommends scheduling BC review once the design package is ready. Current cost estimates are ~\$500K. The Management Committee provided approval to keep planning to allow for BC review.*
5. PDO will add discussions about northern pike population estimates in the Yampa to future agendas as appropriate. 9/17/18: Melissa recommended discussing this before SOW process.
 6. Exploration of using alternative methods of nonnative fish control in systems where traditional mechanical control is ineffective/infeasible. Kevin/Tom/Don will start the discussion with relevant parties and bring agenda items back to the BC as necessary for both the White and the Duchesne. Kevin will talk to Jenn, Chris Smith and Matt Breen to get more information around the White and Kenney Reservoir. 9/17/18: Don and Tom discussed releasing water in the White for algae control, which might also have benefits of removing nonnative fish. Tom said they released water in early July to control cladophora. CSU field crews were on site and the PDO will check back to determine the effects on the fish population. Kevin Bestgen confirmed sampling occurred pre- and post- flow. The data has not been worked up yet, but will be in the

off season. Kevin Bestgen thinks the event occurred pretty late in the spawning season and may not have had a large effect. Tom noted that Alden said it may need to occur on an on-going basis for algae control.

7. SOW Updates (delete after SOW process in FY2019):
 - Update Stewart Lake management SOW. Matt Breen will revise the SOW for FY19 and beyond.
 - John Caldwell - will fix the map on Project 129.
8. The hatcheries need new guidance from the PDO which will incorporate HCP protocols. Julie Stahli will provide as time allows. Guidance will include collection and reporting of environmental data. Stocking discussions will happen earlier in the year and be more comprehensive. *11/8/18: Julie and Cheyenne will convene a group of BC members and hatchery managers to develop a plan forward for bonytail.*
9. Geomorphology/CPM nursery habitat symposium - Jerry Wilhite and Melissa Trammell will explore starting a symposium at either the Researcher's Meeting or Utah AFS. *Pending.*
10. PDO will figure out how best to distribute spill contact information (potentially on the website). *Pending.*
11. Kevin McAbee will hold a nonnative fish workshop sometime in the Winter-Spring of 2019-2020.
12. PDO will start conversations around a razorback sucker monitoring plan, including revisiting the 2012 report for recommendations.
13. Maintenance of cheese blocks: Dale will email hatcheries to see how many cheese blocks are still in operation and can be distributed to field crews (done 9/17/18). Julie will distribute information to field crews and compile recommendations for when cheese blocks should be used (done 9/28/18).
14. PDO will develop and distribute a list of staff responsibilities to the Program after their upcoming staff meeting.
15. PDO and UDWR will distribute information about the Researcher's Meeting and upcoming BC meeting as it becomes available including potential symposia or associated meetings and Matheson field trip. Includes previous assignment: PDO will convene a group to explore data around pikeminnow avoidance of electrofishing and

present results at the January 2019 BC meeting. In conjunction, Dave Speas will request that Mary present at the Researchers meeting if possible.

16. Melissa will develop a SOW for monitoring of vegetation and channel narrowing as part of the 20-21 SOW process.