Upper Colorado River Endangered Fish Recovery Program

Dated: January 3, 2018

Biology Committee Webinar Summary, October 27, 2017

PARTICIPANTS

Biology Committee: Dave Speas, Melissa Trammell, Shane Capron for Jerry Wilhite, Tildon Jones for Dale Ryden, Paul Badame, Brandon Albrecht, Pete Cavalli, Tom Pitts, Harry Crockett, and Bill Davis.
Others: Tom Chart, Kevin McAbee, Don Anderson, Julie Stahli, Angela Kantola, Darek Elverud, Michael Mills, Kevin Bestgen, Katie Creighton, Matt Breen, Koreen Zelasko, Doug Krieger, Ryan Christianson, Mark Wondzell, Brian Hines, and Melissa Mata.

Comments submitted by: Paul Badame, Matt Breen, Dave Speas and Pete Cavalli

CONVENE: 8:00 a.m.

1. Review/modify agenda - final modifications reflected below.

2. Discuss/approve Bestgen et. al (Green River Colorado Pikeminnow 2000-2013)

   Kevin Bestgen said this is the third version to estimate abundance in 5 reaches in the Green River basin using the most recent full dataset from 2011-2013 (3 samples completed in each year in each reach). Data has been evaluated over the entire period of record (2000-2013) which both increases and decreases estimates. We see declines in abundance in all reaches over time. Deso and Lower Green have remained stable, but at a lower level than the other reaches. Lower Green and Deso had a large year class in 2011 that should have grown into recruit and adult sizes, but those fish were absent in 2012 and 2013. We haven't seen evidence of them even in recent sampling, so the strong year class is currently unaccounted for, which may have been caused by walleye invasions in 2011. Catch rates indicate walleye populations were higher than adult pikeminnow captures, which could have dramatically reduced the number of juveniles available to recruit. We have not seen a strong year class since then. Recruitment is not strong across the Green River basin. We are having some estimation issues across the sampling period (Fig 10). Capture probabilities have declined over time, for reasons we cannot currently understand. This decline in capture probability changed previously reported estimates. Adult pikeminnow declined in the 2011-2013 period, and we have lower captures in the 2016 data as well (no population estimate available yet). Capture rates decline across each of the three sampling years, then pop up after the break occurs which may be a sign of avoidance behavior in the fish, but we don't have enough data to draw conclusions. Questions remain regarding gear changes across the years - the ETS units may not be picking up fish as well as the historic Smith-Root units. Historic capture rates were ~10%; in 2011-2013 capture rates declined to less than half that. We may be able to use additional data (submersible or permanent antennas) to try to figure out if the probabilities of capture are legitimate. Other options include using radio transmitters in fish to detect behavior changes based on electrical fields or boat motors. Block and shock techniques are the most effective at catching higher percentages of fish, but require much time and effort. Thanks to Dave Speas, Tildon Jones, Katie Creighton and Matt Breen for

their support and review. Kevin Bestgen is still working on the piece highlighted in yellow on page 28 (adding a single flow covariate) and expects to be done soon. Kevin recommends that unless substantial changes, the final report could be approved via email. If a major shift occurs, he would bring it back to the committee for review. The strategy was approved by the group. Dave thanked Kevin for previous revisions and asked if survival estimates on pg 41 could include a graphic; Kevin said that could be a possible addition. Dave is concerned that increased shocking effort on the river from enhanced nonnative removal and population estimate sampling may be driving reduced capture probability. Melissa noted that fires and subsequent water quality changes might be causing an impact (2012) and she would like that noted in the report. Melissa asked if there was a recommendation to evaluate trap-shyness in the document; Kevin said yes, but specifics are not addressed. Tom Chart wondered if Green River Canal operations at Tusher possibly had an impact on that 2011 year class and asked that the additional hypothesis be included in the report. Kevin McAbee noted that 2012 and 2013 were both low flow years which funnels proportionally more water and therefore more fish into the canal. Kevin McAbee also noted that more small fish are typically salvaged at the end of the season and are far less likely to be tagged so they would go into the canal undocumented. The possible effects of the canal can be seen in the annual report from last year (C28a) or in the PVA for pikeminnow. Kevin Bestgen said the majority of the young fish were downstream in the Lower Green, but there were a substantial number in Deso/Gray as well. Tom Chart thanked Kevin Bestgen for the retrospective analysis of earlier population estimate periods on page 66, but noted the reference might be off in the text between (says figure 18, but should be figure 19?). Tom Chart asked for a table of recalculated population estimates and CI's for the earlier time periods; Kevin agreed. The Committee approved the report contingent on follow-up analysis (page 28) and emails.

3. Discuss smallmouth bass spike flow study plan

Kevin Bestgen reviewed the spike flow proposal outlined in the Oct 13 email from Tom Chart and attached power point. In discussions with GREAT team and evaluation of Muth et al. flow recommendations, the group is recommending experimental flows to benefit native fishes and disadvantage nonnative fish. The recent colonization of smallmouth bass in the Yampa and upper Green Rivers is substantial. We are addressing that with nonnative fish removal efforts, but are looking at ways to reduce reproductive success on a much larger scale. Smallmouth bass eggs and larvae are turbidity and flow susceptible; as nest spawners, they need parental guarding to prevent mortality. Covering eggs with mud or displacing them away from the adult male with high velocity water seems to dramatically reduce recruitment. A flow pulse from Flaming Gorge dam might influence nest success in Lodore and downstream of the Yampa confluence. The upper Green River below Flaming Gorge dam would be a logical place to run this experiment. There is a date range available after LTSP flows entrain larval razorback and before pikeminnow recruitment where we may be able to affect smallmouth bass but not affect native species reproduction. The team would pick years of low to average flow because spikes would not likely be effective in high flow years. They think spike flows would dramatically disrupt spawning areas and increase flows in side channels and would time flows based on smallmouth bass spawning temperature thresholds (16 C) in the river. LFL would monitor fish pre-spike and again post flow-spike. Kevin thinks half or more fish may be affected with a single event, but acknowledged this was an experiment (hence the intensive monitoring effort). The graph on slide 7 shows how bass production could be

conceptualized into three cohorts, and flow spikes could be applied in any cohort; cohort 2 is potentially the optimal timing because you impact the most young bass, impact previously hatched bass from cohort 1 (the bass hatched early are most likely to survive over the winter), and pikeminnow are not yet in the river. Smaller fish hatched later (cohort 3) are less likely to survive the winter anyway. If we try these experiments, timing is critical - there are a very few dates when maximum effect could be seen. Paul asked if the dates overlap between LTSP and larval razorback river entrainment and potential spike flows. Kevin said the dates do not overlap across the slides (slide 3 is conceptual and slide 7 is empirical data from 2007), but that timing will change across years based on in-river conditions. Kevin said that bass do not spawn successfully until after Flaming Gorge releases have declined to base flow levels, so we are unlikely to impact razorback entrainment in any year. Kevin has pretty good evidence that this will work based on the Yampa River flows in 2015 (expected and observed). We would expect a pretty continuous hatch date distribution without the presence of a flow spike (open bars on slide 9). In 2015 we saw a flow spike on July 11 that was accompanied by substantial turbidity because of a severe rainstorm (slide 10). The middle part of the smallmouth bass cohort was removed (depicted by the open, non shaded bars). A few of the early fish survived, and a few of the later fish survived, but the vast majority of the middle of the distribution is eliminated. The magnitude of the flow spike from this event was significantly less than the recommendation for Flaming Gorge, but Kevin believes turbidity had a substantial effect. With only physical displacement, we will need increased flow. The team could dial this back in the future, but we need to have a large flow to be able to document a biological effect. The Green River downstream of the Yampa in 2015 showed the same effect (reduction in smallmouth bass reproduction and high turbidity post flow spike). This field data shows that we could reduce juvenile populations reach wide which would impact adult populations. Kevin believes we would need to do this multiple years in a row in order to have a substantial effect on adults. If we don't, a single year class can easily fill in holes in the adult population left by previous lack of recruitment. Kevin explained additional evidence from pikeminnow larval drift sampling whereby displaced bass fry were captured following tributary flow spikes. Normally, they see no drifting bass during low flow, clear water conditions. They do not believe this will affect native fish species because they are not nest spawners. Native fish deposit sticky eggs in interstitial water in high velocity habitats, which would be less likely to be impacted by increased flows. It might impact terrestrial ecosystems if vegetation are dispersing seeds during these periods. It may also change temperature or create compensatory survival in unaffected smallmouth bass cohorts. Uncertainties, considerations, and descriptions of the monitoring plans are outlined in the study plan. Tom Chart noted that the GREAT team has talked about this extensively. The study plan would be attached to the GREAT report and would eventually go through the Recovery Program approval process. Kevin McAbee added that it is vitally important to think about these landscape scale actions, especially in the post-Recovery period following 2023. This type of action could replace mechanical removal as a control for nonnative fish on a significant level and reduce nonnative fish management costs in the future. Shane noted that WAPA is looking at funding a project with Argonne to use the 2015 LIDAR data from the dam to the confluence with the Yampa to determine inundation across a wide range of flow levels; the proposal is up for funding in 2018. Tildon asked if there is any way to look at water velocity through those channels as we could inadvertently create bass habitat in low velocity side channels if releases are not high enough. Shane will look into the possibility of evaluating both inundation and flow and suspects that the latter might be a second layer of analysis. Melissa noted it seems like we should be aiming for a flow at which most of the habitats in that section are flowing at significant levels. Harry asked if the LIDAR study would need to be completed before we could

implement spike flows. Kevin Bestgen and Tom Chart both noted that the spike flow could occur without the LIDAR study. Shane said NEPA may be needed (entirely Reclamation's decision), but the LIDAR study was developed to take advantage of low hanging fruit and not as a preemptive step. Tom Chart said comments on the study can be sent to Kevin Bestgen, but we are not seeking Committee approval at this point - the GREAT will prepare a final draft. Don asked how much notice we could give the public when/if the spike flows were going to occur. Kevin said that once we know that bass are spawning in the river, we have up to about 2 weeks to implement the spike flow. Kevin noted we may be able to use flow and temperature models to increase the notice period.

4. Discuss proposed larval drift study to validate USGS particle-tracking model

   USGS has developed a quasi-3D flow model that can predict larval drift of sturgeon that could be used to assess razorback sucker drift. These flow models include lateral flow vectors which accurately predict drift of particles and larval fish movement. Tom Chart explained that the physical portion of this is being funded by non-Program USBR end-of-year funding and USGS. We didn't get outside funding for the biological (LFL) portion, but believe we have FY18 Recovery Program funds for LFL's portion of the drift work. The biological portion would study larval drift from the spawning bars down to Stewart Lake (12 miles) using marked hatchery raised larval fish. Kevin clarified that we may be able to create structures to help drive larvae into wetlands using flow dynamics. Melissa asked if this project is time limited. Dave clarified that the physical modeling part would occur in March of 2018, with the biological portion to follow in May/June. Melissa asked how this project could be applied in management. Tom Chart said that we will be able to validate the model at Thunder Ranch and Stewart Lake. Once the model is validated, we could look at Stirrup, Baeser, and Above Brennan to see how we could affect entrainment at those locations. Dave Speas said the model could potentially be used in preparation of breach designs for the Stirrup. Tildon said we assume the amount of water in the river is proportional to the amount of larvae that we can entrain (this is based on past bead work), but questions that assumption and believes larvae act differently than inert beads or particles. Kevin Bestgen explained that how the entrances are shaped and the velocities around them are important determinants to success in entrainment. Melissa noted that we have already selected many of the locations we are going to work on and that we already know that eddies at the mouths of the wetlands help entrainment, thus she questions the additional value of these studies. Dave said we might be able to increase entrainment at Thunder Ranch. Tom Chart noted that the USGS is interested in the practical application of their modeling, i.e., applying this technology to reconnect a wetland to the river. Melissa asked if the Committee is interested in funding this effort and noted that we should consider this in the context of the items on the contingency list. The contingency list has Matheson and FR-BW Synth larval pikeminnow sampling in the lower Green River. Tom Chart clarified that the Program funds would be a single year's worth of funding matched with over $180k for the USGS work. The Committee approved the expenditure of $44,723 to fund Kevin's work in 2018.

5. Update on flow temperature monitoring matrix

   Don Anderson described the matrix sent to the group October 24th. The intent was to develop a complete list of all temperature monitoring information across the Program, with the goal of clarifying simple questions around what built our temperature program. Don asked the Committee's

feedback as to whether this effort is important to the Committee (whether it is valuable to have this comprehensive information), whether the format is helpful and who might be valuable to contact regarding why the sites were developed and how the data are currently being used. Don reviewed spreadsheet columns, focusing especially on the column that identifies uses for the data. In a few weeks, Don will send the matrix out to PIs to try to fill in any additional information. Kevin Bestgen said they use the temperature monitoring data extensively and it makes sense to have this account summarizing what's being collected, etc. Kevin noted there may be additional data collected at even a finer level that we could incorporate into the dataset. Kevin said there were additional justifications created by Doug Osmundson, which Don will search for. Tom Chart reiterated that gages are a common place for people to try to reduce funding, but they are often the foundation for future studies.

6. Field updates

- CPW
    - Colorado River: CPW caught two northern pike in April, in one Colorado River backwater near Rifle where pike are commonly found. Since the July report, CPW sampled the Silt to De Beque section, plus the Rifle backwater a couple additional times. No pike were found, but a small number of smallmouth bass were collected (all from the same Rifle backwater).
    - CPW completed mark-recapture passes in the Colorado River this fall (whole-community sampling coupled with NNF removal). Each reach was 2 miles long. Station 1 is above Rulison, no pike or smallmouth bass were found. Station 2 which is below Parachute- no pike or smallmouth bass were found, despite the presence of a large backwater. Jenn feels we are seeing fewer centrarchids of all species, smallmouth, largemouth and sunfish. They really only find them looking hard in backwaters whereas we used to find largemouth and sunfish in most backwaters.
    - As reported earlier, they pulled the Merwin Trap from Mamm Creek Pit #1 near Rifle in late June after high flows had subsided: removed 306 pike compared to 292 last year. Also netted pits #2 and 3, catching only one pike in each. These were large fish, suggesting they probably got into those adjacent ponds several years ago during high water when there was a connection between ponds. No evidence suggesting successful recruitment was found in either pond 2 or 3. White River- CPW finished passes on the White in late June and then ran out of water, which included 7 nonnative specific passes and 3 (each 5 miles in length) fish community composition passes, (all nonnatives were removed). Results of that effort were reported in the July 2017 BC meeting. They hoped to do more passes this fall but never got enough water to sample. All data are submitted to LFL, so final numbers are not available, but it appears that nonnative numbers are up slightly compared to last year. Roughly the same number of fish were captured as last year but in seven passes instead of nine. This may be due to a strong 2015 year-class showing up. CPW captured just 2 pikeminnow this year, but didn't sample much in late

May and early June when the fish would have been abundant. Both pikeminnow were very large gravid females, one a recapture previously encountered in 2015.
    - Highline sampling in Mack Wash will occur in November after they finish running water.

- LFL
    - Completed all field assignments which will be reported in annual reports. Pikeminnow detections in Vermillion Creek have increased significantly using two wagon wheel antennas in conjunction with the high flow releases from Flaming Gorge. LFL detected 74 individual pikeminnow, 7 tagged flannelmouth suckers and a number of unidentified fish, as well.

- USFWS-GJ
    - A record number of humpback chub was collected in Black Rocks during the last pass of this year's population estimate sampling (ended last week) -- well over 100. Data are currently being entered. There were chubs of all size-classes collected, indicating successful reproduction and recruitment.
    - USFWS brought another 10 humpback chub from Black Rocks into captivity, raising the total Black Rocks broodstock to 28 fish, which are now being held in refugia at our Horsethief Canyon Native Fish Facility near Fruita, CO.
    - USFWS will finish nonnative fish removal efforts this week. A large number of walleye were collected this year, especially in the Bighorn Camp to Cisco section of the Colorado River (just downstream of Westwater Canyon); data are currently being entered. The last overnight sampling trip (October 23-24) will sample this section one last time.
    - The fish ladders shut down October 20. A record number of endangered fish used the Grand Valley Water User's fish passage just upstream of Grand Junction on the Colorado River this year. USFWS found all four endangered fish species using this ladder for the first time ever, including two Colorado pikeminnow (one of which is estimated to be a 1982 or 1983 year-class fish, based on its size when originally tagged in 1993 -- close to 35 years old).
    - Canal salvage efforts in the Grand Valley Water User's and Grand Valley Irrigation Company's canals will take place from November 6-17. Last year, crews repatriated over 50,000 native fish (including about a dozen endangered fish) back to the Colorado River via this effort.

- USWFS - Vernal
    - Johnson Bottom gate was closed this week and 106 adult bonytail and at least 44 juvenile razorback sucker were collected during draining, both of which were stocked into the wetland. Abundant levels of adult yellow perch (which is what was stocked in Red Fleet as part of the new fishery) were also collected, but no evidence of perch reproduction was seen. Crews also caught two smaller 200-250mm walleye. (UDWR said Red Fleet didn't spill this year.) The outlet works channel at Red Fleet will be screened by fall 2019 to

prevent this escapement (should exclude larval size + fish). Johnson was drained to less than 1 ft of water, which they think will freeze to reset the wetland this winter (Tildon will validate this assumption).

- USFWS completed all other sampling in conjunction with UDWR-V and found 10 bonytail in Stirrup and four adult razorbacks in Above Brennan. Crews set hoop nets, fyke nets and seines in Sheppard but no endangered fish were found. DO meters indicate there is low or 0 DO, probably because this was the inundation in recent years causing high levels of decomposition which reduced oxygen concentrations. Ssome green sunfish were found despite the screen being in place. Dave asked if supplemental water was added to Sheppard, Tildon said water availability was lower than anticipated which caused logistical issues. The Refuge figured out that putting water in Sheppard depressurizes the irrigation water for the hayfield, so the two efforts would have to occur sequentially.
- Green River Canal salvage will occur in mid-November.

- UDWR-Moab
  - Almost completed fall sampling (one Cataract trip going out right now - 30 hoop nets, electrofishing and trammel nets). Canal salvage will wrap up in mid-November
  - Walleye populations in lower Westwater were increasing (19 walleye, 2.7 fish per hour), 35 smallmouth and 37 gizzard shad. One walleye was found up by Tusher. Crews will try to sample both lower Westwater and Tusher again this winter.
  - ISMP sampling yielded 25 YOY pikeminnow on the Green and 2 on the Colorado, which is down quite a bit from the last couple of record breaking years. Both quality and quantity of 0-velocity habitat has decreased in recent years.
  - Matheson wetland - UDWR is moving forward with Stage 1 construction, the Army Corps of Engineers is surveying wetlands, ponds and channel construction will be completed this winter so a functional wetland should be completed by spring.
  - Westwater - total number of 1611 chub were captured: 374 humpback, 1237 roundtail, and 218 juvenile chubs. Nineteen are thought to be humpback chub. Sampling started earlier by one week but temperatures ranged from 21.5-23 degrees C (up from high teens) and clearer water persisted which may have affected capture rates. Crews started setting nets later and picking them later to reduce stress and caught few nonnatives, a few pikeminnow, 14 bonytail and one adult razorback.

- UDWR-Vernal

  Project 123b: targeted SMB removal (6/26/2017–9/28/17)
  - 341.2 hrs effort; 3,985 bass removed, mean TL=154 mm (43–410 mm)
  - Shift in size distribution to smaller fish; 72% of SMB were <176 mm
    - 2016 mean TL=186 mm (37–455 mm)
  - SMB removal CPUE = 11.68 fish/hr vs. 6.45 fish/hr in 2016

- Highest densities in the 20 miles below the White and Duchesne River confluences (RM 246–226)
- 16 northern pike, 9 walleye, 1,215 white sucker, 19 hybrids, and 1 white crappie removed (previous update)
    - 2 juvenile walleye (TL=208 & 241 mm); 1 confirmed diploid, other sample awaiting analysis
- In all 123b phases: 11 endangered fish/PIT tags removed from walleye, pike, and SMB stomachs; three 2016 Stewart Lake razorbacks, 4 bonytail, and 4 unknown

Project 138: Middle Green River ISMP sampling (9/18/2017–9/26/17)

- Seine effort = 3,740 m^2 of habitat in 1° & 2° backwaters; 1,256 m^2 additional in 3° backwaters
- Habitat availability limited with high base flows; backwaters covered up (water or shifted sand bars) or remained connected (>500 cfs higher during 2017 sampling than 2016 & 2015)
    - 25 fewer days below 3,000 cfs than 2016; did not reach this mark until 8/5/17
    - Mean daily discharge = 2,910 cfs from July 11–Sept. 18; ~700 cfs > 2015 & 2016 base flows
- 1 YOY pikeminnow collected (52 mm; CPUE=0.027 fish/100 m^2) + 1 juvenile (114 mm)
    - 3rd lowest YOY total on record, 4th lowest CPUE
- 76 blueheads (mean=40 mm), 16 flannelmouth (mean=56 mm), 13 *Gila* spp. (mean=65 mm), and 3 speckled dace (mean=42 mm)
- 5,925 nonnatives in first seine of 1° backwaters (99.4% big 3 cyprinids); 11th highest total on record
    - 1 northern pike YOY (TL = 294 mm); last collected from ISMP in 1998?

Project 165: Stewart Lake (draining phase only)

- Draining occurred from 2–24 October 2017: 22 days of continuous fish trap operation, also collected yellow perch during draining.
- Complete draining of the wetland is not possible following the mid-summer outlet gate repair; location of the safety pins won't allow the gate to sit flush (UDWR personnel not present during the repair). Need another repair on the gate to improve functionality. Melissa asked about next steps for the gate repair. Matt will coordinate with USBR and update the PD/committee/Dave/Ryan as needed. Matt talked with USBR and a meeting will occur in November. *11/7/17: Matt Breen met with the Provo BOR on 11/3/17 to make the repair and the gate issues are now resolved.*
    - Functional issues: ~18 inches of water remain in the wetland & an undesired fish "kettle" created
- Endangered fish production low; only 2 YOY razorbacks (TL = 126 & 135 mm) sampled during draining, there may be more as they are the last to leave the wetland.
- For 3rd consecutive year adult bonytail accessed the wetland during filling (12 adults sampled during draining) & potentially spawned during the entrainment period
    - 13 YOY *Gila* spp. (49–78 mm TL, mean=59 mm; awaiting LFL verification)
- Discussions ongoing to determine an approach to deal with encroaching cattail. Add cattail issue to the next BC agenda. Matt clarified that getting back to original condition will take many years.

Measurements at the new outlet gate (end of draining).

Encroaching cattails an escalating issue.

6. Floodplain prioritization

Tom Chart described his office's task to identify priorities for floodplain restoration for our limited capital funds. As discussed in July, there was interest in looking at Green River, Gunnison and Colorado sites independently. The Program Director's office tried to populate the column headers with important characteristics for prioritization and would like feedback on whether or not those are the right column headers. Dale's crew, Katie, Tildon, Matt, and Dave Speas helped fill in all of the information in the tables in specific locations - thanks to all for their efforts. We tried to use all of the information available including Valdez and Nelson, the white paper from Speas et al., and the Argonne floodplain connections studies. Tom asked if this is the kind of information the Committee thinks we need from a hydrological and biological perspective. Tom noted that survey information from individual wetlands is probably the next step in the prioritization. Melissa asked if we need to include a category for time-sensitive decisions (e.g. Matheson), but praised the general effort. She noted there might be additional sites on the Colorado. Tom said Dale helped to winnow down all of the sites in the Grand Valley to remove the gravel pits that are very deep and have nonnative fish established that would not be easy to remove or reset. Tom also highlighted Katie's addition of the Lake Powell inflow as an important area for nursery habitat and noted the inclusion was more for a complete picture of reproduction as no infrastructure improvements are likely/possible. Melissa asked how we rate/rank the given wetlands. Tom clarified that the first step was trying to get a handle on what information we would need to rank. Dave suggested adding a field on potential partnerships that might make some locations more appealing. Dave also suggested increasing communication with Ouray to see how priorities might align with those of the refuge. Dave will review this with Brent before he retires to see if he can offer any insight. Dave noted the Matheson preserve is far enough down in the watershed to collect a significant amount of larvae, but the wetlands higher in the system (Grand Valley) might be too far upstream of most spawning activity to be effective. Dave highlighted Travis's work with wild-spawned razorbacks in CDOT ponds, but would consider those a separate effort from LTSP and larvae entrainment efforts. Dave noted that the bathymetric survey for Stirrup should be wrapping up (it is currently holding about 5 feet of water). Dave highlighted Leota 7 and others with current infrastructure as important. Tom asked Darek about his first impressions of the Horsethief area for entrainment/rearing potential. Darek confirmed that Horsethief State Wildlife Area might offer habitat renovation opportunities. It is USBR property that is managed by CPW. >Tom asked for comments be submitted within two

weeks to the Program office. Tom will take it back to Brent and Ryan and see about next steps. Tom asked Katie if $900k is still what she expects to need for Matheson. Katie said that the phase 1 funding came from UDWR and TNC (~$330K) which was a linear pond, concrete structure and nonnative fish screen to fill if flows support filling in 2018. Katie also said that Mill Creek restoration might add water in future years. Melissa asked for a >written update from UDWR regarding funding needs.

7. Bonytail conservation group update

   Paul Badame said the October 3 conference call centered on buoyancy issues in bonytail. The problem is only seen at Ouray when they bring them from ponds to tanks, so they think it might not be a problem we need to address. A Health Condition Profile (HCP) workshop will be developed to try to get all hatcheries to implement HCP consistently over time. The workshop will cover HCP of bonytail and razorbacks in Grand Junction on November 29th. Anyone who is interested should contact Paul or Krissy at UDWR. The workshop will include a start to finish protocols including autopsies, necropsies, how to sample, data entry etc. >Paul recommended that someone in the Program Office be the repository for all of this data and provide an annual summary report instead of maintaining it at one of the hatcheries. Dave asked if HCP data has provided helpful information in the past. Paul noted that the workshop could review what we can get from historic data and clarified that this effort has come from differences seen between fish that spawned in the hatchery versus fish that spawned in natural systems and is centered on trying to improve our protocols during rearing (especially prior to release). >Paul will forward information on workshop to the Committee *(done on Oct 27)*.

8. Humpback chub translocation update

   A draft of the report is available from Rich Valdez. Melissa will be contacting the ad-hoc group to set up an additional meeting. The group was interested in humpback chub that were naturally spawned in the Horsethief ponds, but the genetic information regarding origin was not conclusive so they did not recommend using them for stocking. Those fish have been moved to David Ward (USGS) for experimental purposes.

9. Humpback chub SSA update

   Tom Chart reviewed the SSA process to date. Discussions started in 2015 with a Recovery Team and then the SSA started in 2016 through the Science Advisory Group. Rich Valdez has been the main author. Seven versions have been completed to date. The last version (7) was sent out for peer review in July. No fatal flaws were identified, but the viability timeframes were of concern. Version 7 identified one generation time of 8 years as a biological relevant time frame. The current draft, version 8, looks at 16 years as the biologically relevant time frame and looks out 30 years for long term viability. Comments were received from Charles Yackulic (GCMRC) regarding validity of the viability analyses, which will be incorporated into the draft SSA. The PDO is working with Region 2, primarily to clarify the nonnative fish threat to upper basin populations. Julie Stahli was pulled in for fresh eyes and started examining the train of thought throughout the document. We noticed that after 7 versions, the logic was getting a little muddled. The FWS Regional Director wants a final meeting by December 13th so we are scrambling to complete the SSA by then. Tom

clarified that Rich did a lot of great work looking at species needs, current needs, future needs and viability. The PDO's focus in now working with Region 2 to revise the executive summary to present the decision makers with a clear and concise rationale for our conclusions on viability. Melissa asked if a Recovery Team meeting would occur before the December 13 meeting with the Regional Director; The Science team met November 9th to provide final input.

10. Review previous meeting assignments - see below

11. Review reports due list

12. Review agenda items for January meeting and review Researchers Meeting logistics
    - Update on Researchers Meeting (on DOI Conference Management System "dropped list," meaning it was evaluated and deemed not a conference). The trip purpose for DOI employees' travel authorization should be mission operational. Tildon said registration fees would not be charged as it is not a conference. USFWS-Vernal will incur costs for social and breaks that will be reimbursed by a suggestion donation amount from individuals payable at the conference, as per usual (this cannot be claimed on DOI travel forms). Tildon noted he is accepting donations for break prizes should anyone have good slightly-used or entertaining items on hand. The Ledgestone will be providing group rates at $49 per night. Details to follow. Kevin McAbee reiterated that we will not have a nonnative workshop this year, but conference call invites will be sent to PIs for December scheduling. Melissa asked if Committee members could be included. Matt asked for a doodle poll to set the meeting. Kevin will consider all requests and address as he can.
    - Agenda items:
        - Updates to nonnative fish actions/SOWs
        - Deso/Gray humpback chub report
        - Floodplain prioritization
        - Wagon wheel antennas
        - Controlling cattails at Stewart Lake
        - Matt Fry's report on tagging small bonytail and razorback
        - Selenium report from Barb Osmundson

13. Consent item: Review and approve July 13-14, 2017 Biology Committee meeting summary – A draft revised summary with comments from Dale Ryden and Dave Speas was sent with this agenda. Approved with revisions; Julie will finalize the summary and post to the listserver and the web. Done.

ADJOURN: 12:10 p.m.

Attachment 1: Assignments (not discussed)

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. 1. Humpback Chub (broodstock development / genetics)
As identified in the 2012 sufficient progress assessment and requested by the Management Committee, the **Program** will develop an action plan for establishing refugia for humpback chub (avoiding getting bogged down in genetic analysis). 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 Czapla sent to BC 1/21/15); >Melissa Trammell will find and send the plan development proposal document to Tom Czapla 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 Czapla 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 Czapla 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 Czapla** 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.

3. Kevin McAbee suggested the **database manager**'s first assignment should be summarizing and analyzing the STReaMS bonytail data, to provide the committee and hatcheries with an initial idea of the number of fish that remain in the system over time, and the characteristics of those fish. The Committee agreed. *1/12/17: Julie presented some information at the researchers meeting and will continue this work with the PIT antenna information. 5/23/17: Presented information. >**Julie** will continue to look at flow relationships and health conditions. >**Tom Czapla** will get health condition*

information distributed and check with Bozeman on the fatty liver analysis. Wahweap and Ouray-RH are the only two who are doing health condition analysis. Tom has asked all hatcheries to do this prior to stocking. Krissy Wilson put up a google site with all necessary references. Tom said we will provide additional training later in the year, maybe October. Tom contacted Gibson Gaylord (Bozeman) who was doing fatty liver analysis. He has samples from Ouray (conditioning ponds that are in natural conditions and normal fish) and Mumma. Results will be presented in summary for bonytail addressed below. Tom Czapla will ask for additional context from the Bozeman Lab. The group (below) is talking about sampling wild roundtail chub to use as a comparison species, but needs to work out details.

4. Bonytail Stocking Strategies >***Tom Czapla*** will coordinate a call to strategize bonytail stocking, starting with the group currently convened to discuss stocking locations. Interested Committee members should let Czapla know if they'd like to be part of that discussion. A conference call was held on July 11, 2017. Tom Czapla will get a summary out to the BC next week (July 17-22). *Tom emailed a summary to the Committee on July 21. 10/27/17: to be discussed at upcoming health conditions profile workshop. Paul recommended that >someone in the Program Office be the repository for all of this data and provide an annual summary report instead of maintaining it at one of the hatcheries. Paul will forward information on the upcoming workshop to the Committee (done Oct 27).*

5. 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? 10/27/17: Any additional comments should be submitted by Nov. 15; this will be on January meeting agenda.*

6. **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.*

7. Floodplain follow-up assignments:

- 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.*
- The **Program Director's Office** will reach out to Dave and Brent to establish scope to get action on the ground at Stirrup. **Dave Speas** will share any results from Provo office surveys with the Provo office and continue discussions. Scope of work was developed by UDWR and BLM which is almost done.
- **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.
- Katie will provide an update about when UDWR would request additional funds for Matheson and how much.

8. Regarding grass carp, >**Biology Committee state representatives** will review/describe grass carp stocking regulations and summarize stocking history *(Pete Cavalli provided a map showing grass carp producers and suppliers on 1/15/17; he has also provided Kevin McAbee with a list of grass carp stocking in the Green River drainage in Wyoming).*

- **Kevin McAbee will ask Mark Fuller** to contact the Ute Tribe to review/describe their grass carp stocking regulations and summarize stocking history. *Done; awaiting response.*

9. **Dale Ryden** will check with Barb Osmundson on the status of the selenium in razorback sucker report. *5/23: Barb has retired, but working as a volunteer. The report is written and Barb is working with a reviewer on some revisions. 10/27/17: Draft sent to Committee on 10/18/17.*

10. **Julie Howard** will revise the Deso/Gray humpback chub report, respond to comments, and send these documents to **Tom Czapla** to share with the Biology Committee. Dave Speas will submit comments to Julie by c.o.b. March 14 (done). The Committee will consider the revisions and responses and either decide to approve via email (preferred) or discuss on the May webinar. *10/27/17: PDO received a draft from John Caldwell about a week ago.*

11. FY18-19 Work Plan:

o **Dale Ryden** will revise scopes of work to reference SOW 15 (*Done)* and **Kevin Bestgen** will revise SOW 15 to add costs. 10/27/17: Dave Speas needs the costs on these SOWs

- **Matt Breen** will revise will revise new scope to cover multiple species and multiple targets, add reporting requirements and delete floating antennas by August 10th. *Done (sent to Tom Czapla 7/18/17; PDO posted on the website).*