



**Upper Colorado River
Endangered Fish Recovery Program**

Dated: October 24, 2017

Biology Committee Meeting Summary
Grand Junction, Colorado, July 13-14, 2017

PARTICIPANTS

Biology Committee: Dave Speas, Melissa Trammell, Jerry Wilhite, Harry Crockett, Dale Ryden, Paul Badame, Brandon Albrecht, and Pete Cavalli. Via phone: Tom Pitts.

Others: Tildon Jones, Tom Chart, Kevin McAbee, Julie Stahli, Tom Czapl, Don Anderson, Angela Kantola, Brent Uilenberg, Mike Mills, Kevin Bestgen, Zach Ahrens, Ryan Christiansen. Via phone: Matt Breen.

Water Acquisition Committee via phone Friday morning: Kirk LaGory

Comments submitted by: Dale Ryden, Dave Speas, Travis Francis and Melissa Trammel

Thursday, July 13

CONVENE:1:00 p.m.

1. Review/modify agenda (Ryden, 5 min)
2. Field updates - The Committee will hear and discuss updates from the field.
 - a. **CSU** - Sampled floodplains with Tildon this spring - still need to evaluate samples. Progressing - almost finished with 700 light trap samples. Brown's Park went well, saw high water and flooded vegetation and only a few pike, but anticipate larger numbers in sampling events in July and September. Detections in Vermillion Creek have documented 74 individual pikeminnow during high flows. Pike and bass sampling in the Yampa are continuing, bass are full-on spawning now, delayed because of habitat availability. Pikeminnow spawned right on schedule, first in drift nets on July 2, which corresponded closely to model results. Sucker ID course was held, mostly for state agencies, had good attendance, maybe a new one next year.
 - b. **CPW** - Elkhead and Ridgway tournaments - Elkhead ended on July 2nd (9 days total), almost 400 anglers sign up and removed more than 1300 fish (mostly SMB) - only 57 anglers last year (582 fish). Very positive reaction from anglers who participated. Lori stocked large largemouth bass with the local bass club prior to the tournament. Fish were marked prior to tournament for mark-recapture, data will be provided by Tory once it has been analyzed. Thanks were expressed to CPW staff, CWCB and Melanie for taking photos. Ridgway tournament is underway (July 7-30). In the first 4 days 663 SMB were removed, estimated to be 16% of adult population. Similar participation to last year. Green Mountain and Wolford have bounties for northern pike. Northern pike and walleye were removed at Catamount and Stagecoach during normal sampling efforts - a

total of 96 pike and 120 walleye were removed from Stagecoach. Removed 610 pike from Catamount (vs 1400 last year) through netting and an additional 317 through fishing and additional gill-netting. Worked with water users to reduce habitat for spawning, will evaluate in coming years. During annual sampling of Rifle Gap, undesirable species were removed. Jenn has completed 2 passes on the White, she may try to do 3rd pass in the fall when flows rebound; noted about the same number of SMB as last year, but also noticed protracted spawning. Found two gravid female pikeminnow around Rangely. Non-native removal (Silt to DeBeque on Colorado) will begin soon. Mamm Creek pits only slightly connected at inlets; still removed fish with Merwin traps, but they believe they prevented escapement.

c. UDWR-Vernal

i 165–Stewart Lake

- Submersible antennas deployed in the outlet channel from 3/28–6/29 to detect native fish attempting to enter the wetland
 - ◊ 6/5/2017 - larval RZ were stacking up in the outlet channel; started filling the wetland
 - ◊ Larval RZ entrainment was confirmed on 6/7 within Stewart Lake proper
- Light trapping in from 5/29-6/10; once larvae were detected at various locations in Stewart, trapping was discontinued to minimize our impact
 - ◊ Outlet gate open for 17 days (6/5–6/21); dragged this out as long as possible to overlap with the drift – final wetland elevation = 5.3 ft at the outlet (~2 ft lower than max fill)
 - ◊ Inlet gate opened from 6/17–7/10 to increase elevation; dense vegetation impedes water movement & unable to top off wetland with the inlet gate until the inlet channel is cleared
 - ◊ Supplemental water delivery was confirmed on 6/25; hasn't been consistent
 - ◊ Mini-dots placed at various locations throughout the wetland to monitor water quality
- Cattails a major concern; only about 2 surface acres are open water as of 7/10 - original plan of using Round-up proved ineffective.
- USBR will retrofit the gate once the river recedes to ensure safety (July/August)
 - ◊ Current foot system does not work based on the placement of the foot

ii 123b–Green River bass removal

- Island Park “surge” began on 6/26; 3 passes completed (total effort = 10.4 hrs), no longer possible to up-run Jon boats after drop in FG releases on 7/5
 - ◊ 34 smallmouth bass removed (mean TL=205 mm; range=70-350 mm)
 - ◊ 2 northern pike (478, 604 mm TL); one with multiple PIT tags in its stomach
 - ◊ white suckers (n=169), white sucker X flannelmouth hybrids (n=4), rainbow trout (n=29), brown trout (n=9) & kokanee salmon (n=1)
- 1st full pass from Split Mountain boat ramp to Tabyago Riffle will be complete by 7/13
- 1 additional pass in the 1st three 5-mile section downstream of Split Mountain
- 2 full passes (Split to Tabyago) will be completed before determining target areas

- 51.6 hrs of effort expended below Split Mountain to date
 - ◊ 66 smallmouth bass (mean TL=218 mm; range=66-370 mm), 5 northern pike (mean TL=609 mm; range=570-675 mm), 1 walleye (TL= 587 mm), 224 green sunfish (mean TL=78 mm; range=45-146 mm), 265 white sucker (mean TL=134 mm; range=66-357 mm), 21 brown trout (mean TL=131; range=64-526 mm), 2 rainbow trout (89mm and 91 mm TL), 1 white sucker X flannelmouth hybrid (TL=229 mm), and one kokanee salmon (TL=126 mm)
- During the bass phase we've captured 12 Colorado pikeminnow, 82 razorback suckers, 16 bonytail, and 4 razorback x flannelmouth hybrids
 - ◊ Several adult Colorado pikeminnow were in spawning condition, and fish under 200 mm ($n=6$) continue to dominate CS captures; likely 2015 cohort
- Paul asked about 1.5 fish per hour catch rate and asked if that would affect how sampling would proceed, Matt noted they will continue to assess and think the low catch rate is flow related.

iii 167–White River bass removal

- 12 days of effort expended from 6/2 to 6/24 (108.1 hrs)
- 9 days of surge effort (state line to Bonanza bridge) on 6/2–6/6, 6/9–6/11, and 6/18–6/24
- 1 full pass (state line to Enron) from 6/11–6/15
 - ◊ 1,513 smallmouth bass removed (CPUE=14.0 fish/hr; mean=112.4 mm TL; 60–338 mm)
 - ◊ More than 3x the bass and catch rates compared to 2016
 - ◊ Majority were age-1 fish; successful cohort in 2016 overwintered well
 - ◊ 49 adults removed (% adults has decreased); 15 ripe and 10 already spent
 - ◊ 20 white sucker (mean=235 mm TL), 41 white sucker x flannelmouth hybrids (mean=384 mm TL), 7 white sucker x bluehead hybrids (mean=268 mm TL) – hybrids concerning
 - ◊ Also removed 1 yellow perch, 2 brown trout, 2 rainbow trout, 5 black crappie, 30 green sunfish
- Natives: 6 pikeminnow (3 recaps; mean=389 mm TL; range=199–706 mm; 2015 cohort spreading out!), 59 roundtail (mean=218 mm TL), and 1 razorback (454 mm TL)

iv Opportunistic sampling in the lower Duchesne River (Three Species surveys)

- Mike Fiorelli (Three Species Biologist) got permission from the Ute Tribe to electrofish the lower Duchesne River by up-running Jon boats as far as possible in each of 5 attempts
- 6/1 bottom 10 miles, 6/7 bottom 15 miles, 6/8 bottom 10 miles, 6/19 and 6/22 bottom 6.5 miles; 30.6 hrs total effort
 - ◊ 38 walleye removed (1.2 fish/hr; mean TL=456.2 mm; range=248–709 mm)
 - ◊ 185 smallmouth bass (6.0 fish/hr; mean TL=222.4 mm; range=61–400 mm)
 - ◊ 2 northern pike (348 & 365 mm)
 - ◊ 152 white sucker (mean TL=191.3 mm; range=79–474 mm)
 - ◊ 8 yellow perch, 1 largemouth bass, 4 black crappie, 42 green sunfish

- ◇ Natives: 7 pikeminnow (190–760 mm TL; 2015 cohort spreading out geographically!), 7 bonytail (207–315 mm TL), 65 flannelmouth sucker (mean TL=401.4 mm), and 1 roundtail (236 mm TL). Mike reported earlier that he observed numerous razorback sucker, but did not work them up.
- ◇ Otoliths were collected from the first 30 walleye and eyeballs from a 254 mm walleye were sent to the lab in WI for analyses

d. FWS-Vernal -

- i Finished all pikeminnow estimates. Almost half were less than 400 mm, captured a total of 71. Sampled from White River to Tusher and added 8 mile stretch after with Grand Junction FWCO and UDWR-Moab. Caught quite a few pikeminnow in that section. Gained Ute tribe permits for the lower White, which was also productive for endangered fish, including lots of razorback at confluence.
- ii White River SMB is over - Jenn from CPW noted it is not navigable by boat at this point. Saw a lot of small fish downstream of Rangely, which is downstream of typical concentration areas.
- iii Yampa River smallmouth bass Surge with CSU is currently occurring.
- iv Completed Yampa SMB removal. Spawning appeared to be delayed by 2-3 weeks, did not see spawning at normal temperatures possibly because of high flows. Same conditions at Island Park (not many bass were captured here either).
- v Sampled Shepherd Bottom and Johnson Bottom and seined suckers identified as razorbacks (juvenile fish!). Shepherd fish are likely from the river, Johnson fish could be from light trapping experiment.
- vi Antennas will be moved from spawning bars to Johnson to assess stocking efficiency.

e. UDWR-Moab - Grass carp collections;

- i Collected three grass carp, all three were confirmed diploid fish.
- ii Deso - bass removal lasted 7 days, bass were throughout the reach and there was an uptick near Rock Creek.
- iii Echo-Split - crew is currently out for marking pass, next year will finish it up
- iv Light trapping complete on Green and Colorado. Completed a lower Cataract canyon light trapping trip.

f. FWS-Grand Junction – Nonnative fish removal (in Butch Craig, Beswick’s, and CDOT ponds) occurred in the spring. Numerous razorback sucker collected during NNF removal efforts in both Beswick’s and CDOT ponds were stocked into the Colorado River. Some of these may have been wild spawned, but many young razorbacks were placed in this pond when they were too small to be stocked in the river. Travis confirmed that the stocked fish were 100-200 mm in length, so these fish were the result of in-pond reproduction. Bonytail from our hatchery are being stocked into the Colorado River this week and next week. Yampa River smallmouth bass Surge going on now and will continue next week. Our fish ladders are very hard to operate during high flows, due to heavy sediment and debris loads. Catches at fish ladders can also be highly variable, depending on water levels in the fish ladders and water clarity (for instance, you can go from collecting something like 3 fish per day when the water is muddy and debris loads are heavy to as many as 1100 fish per day when trash grates remain clean and water

clarity improves). Have collected several RZ in GVWU fish ladder this year. Found first CPM (a 469 mm TL, ripe male) in the Redlands fish ladder - was not PIT tagged at time of capture, it was PIT-tagged and translocated upstream to Escalante on the Gunnison River. Larval sampling in the Gunnison River and on the Colorado River from the Gunnison River confluence downstream to the Colorado-Utah state line has been occurring for about two months now and will continue through early August. Aspinall report on large-bodied fish collections should be completed by this fall. Larval report will be done next year. There was discussion about combining all life stages into a single interim report; Dale will check with staff to see what that would mean to reporting schedule.

- g. **WGF** - Little Snake sampling, second year in a row without northern pike, but found 9 black bullhead above the barrier.

- 3. Matheson Wetland restoration update - Zach Ahrens reviewed new information and budget requests related to the potential Matheson wetland restoration project.

Matheson is designed to operate like Stewart or Johnson. Water currently enters the breach at 18k-cfs, would like to improve connectivity to accomplish full filling 3 of every 5 years (60 acres for more than 4 weeks?). Since 2015, progress has been made with UDWR and TNC. \$70k has been raised for a feasibility study, design completed in Spring of 2017. Design outlined in SOW distributed to the Committee, requires excavation of channel to fill between 17k-cfs and 17.5k-cfs. At 25k-cfs, the pond would be approximately 60 acres, which would occur about every other year. Would lose the ability to exclude NNF at about 40k-cfs. The goal is to allow wetland to drain completely and reset annually. Current design offers ½ inch opening in screens, but they are open to input from the group. Supplemental water is available at 150 gpm which should allow for maintenance of at least minimum pond. Additional water may be needed to maintain larger pond (either from river, current onsite wells or Mill Creek). Wells are currently in place, but pumps would be needed.

Total funds currently committed around \$135,000 from Partners Program and UDWR, \$110k must be spent by next June. Total cost was \$930k, so they are considered a phased approach. \$300,000 in preliminary construction would allow flooding to assess entrainment without larger costs (i.e. adding a headgate structure). UDWR is still \$165,000 short of hitting that \$300,000 at the moment, NFWF grants still in question. Zach requests Program funding of \$150,000 to accomplish the first phase. This would allow for assessment of feasibility before expensive screens and headgates are installed. Melissa asked if fish could be removed after entrainment. Zach noted that the wetland would drain as water recedes, pushing fish back out to the river, but nonnative fish would still be a concern. Tildon suggested a picket-weir to exclude larger fish during filling. UDWR needs to know when they would know if funds are available as they construction could start in the fall. Pete asked how this 3 acres compares cost-wise to Stewart and Johnson. Tildon noted that \$300-\$400k were spent on each, Johnson Bottom is 146 acres (\$268k), Sheppard is 135 acres (the cost for BR to do the project construction was ~\$400K + use of Refuge heavy equipment. To prevent cattails, you need more than a full year of dry system or full water, so you wouldn't be able to fill it every year without encroachment. Supplemental water would keep 3 acres at about 3

ft throughout the season; engineering currently estimate spring is enough to overcome evaporation (about 1 ft per month in July and August). Costs are significantly higher per acre - but it is also our only known option on the Colorado. Current non-natives include largemouth bass, gambusia, carp and green sunfish. Dave asked if additional partnerships might be available for future funding post-phase 1. Zach noted that no one is currently committed to future phases, but TNC and Utah both hold enough interest in this project that construction may start regardless.

Tom Chart noted that this location is ideal from a system perspective, but we expected outside funding to be available for construction; then the program could provide annual maintenance costs. He asked what the BC thinks about the tradeoff for funds vs acreage. Is there another place in the Grand Valley that we need to explore that may be a less expensive option? Dale noted that additional spawning locations are known downstream of those that occur in the 15 mile reach. Brent supported the nursery habitat, but recommends a comparison with other options. Dale suggested a conference call specifically on this effort. Dale suggested that the PDO, Reclamation, and others review potential sites on the Colorado River. Tildon noted that perhaps the small size shouldn't be a deterrent -- large sites are difficult to manage and high-quality small sites can be very effective. Brent noted there is a small site on the Navajo nation on the San Juan - which may be a better place to experiment with small sites. Jerry asked if this could be folded into Dave's analysis of the Green River Wetlands; Melissa said that the Colorado is different from the Green and should be evaluated separately. Melissa also noted there may be another option, a private ranch right by the Westwater input (see picture below). Tom Chart noted we don't currently know what we would need for Stirrup or Above Brennan; it's tough to make these decisions without that kind of information for comparison, but we do have biological/historical information that needs to be considered. Brent noted that we will have good topography this spring for Stirrup (completed by BOR). >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.



4. Begin review of draft FY 18-19 work plan – See also the e-mail and spreadsheet posted to the listserv by Angela Kantola on June 14, 2017. Draft scopes of work are found at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/project-scopes-of-work.html>

Angela thanked Program participants for their hard work preparing draft scopes of work. This is the Recovery Program's ninth biennial (2-year) work plan. Although the budget spreadsheet shows that Program has a serious budget shortfall for FY18 and 19 (and beyond), once again, the Service has reviewed its project costs and projects that it can cover the FY18 and 19 Program budget shortfalls with carry-over reimbursable funds. That said, long-term, the Program needs to find ways to better balance future year budgets so as not to consistently exceed anticipated available funds by >10%. Meanwhile, the Program Director's office commits to investigating Service budgeting to determine how reimbursable funds might be more closely matched to the years for which they are obligated.

Angela recommends that a contingency list be developed should additional funds become available (see end of this agenda item).

Instream Flow

85f - Dave asked if we are confident that USGS knows exactly what we are looking for in this scope; Tom Chart said we tried to outline that specifically and encourages review by Committee members if concerns remain.

>Agreement number for Sediment Monitoring (85f) - Agreement # R17PG0047 needs to be added to the SOW.

FR-BW Synth - Dave asked if larval pikeminnow sampling should be added for approximately \$41k (estimated by Julie Howard). Tom reviewed that this was a recommendation that came out of Bestgen and Hill's (2016) BW-Synth report, which recognized the amount of pikeminnow production in the lower Green River and how more larval production information could influence future flow recommendations decisions. Kevin Bestgen added this could be a key piece of pikeminnow estimates moving forward, at least on a periodic basis as we predict high densities of reproduction in the Lower Green. Added to contingency list.

Habitat Restoration

Brent noted the Program (via agreements with the various irrigation/water user organizations) spends considerable funds for O&M of fish screens and ladders (GVIC, GVP, OMID, Redlands, Price-Stubb - add Tusher later). From 2007-2016 at Redlands, we spent \$45k to \$78k annually depending on debris and flow. The current FY18-19 SOW requests \$87k to cover all possible expenses. Currently, some of these water user projects have considerable carryover each year, and in almost all years, they do not use all of their funds. Brent suggested that budgets be based on long-term average facility costs, perhaps through a

general umbrella scope for O&M on Capital Projects. >Brent recommends bringing this up for Management Committee review.

Floodplain wetlands (FR-164) - The scope notes an increase in funds is possible. Costs won't be known until Sheppard comes online and is managed for a whole season, but it may be covered by CRI funds. If Old Charley comes online again, this may increase costs as well. >Tildon will create an addendum and outline potential costs.

Support was mentioned for a full scope of work for maintenance on permanent antenna arrays from USU - anticipated for the FY20-21 cycle and beyond.

Nonnative Fish Management

Kevin thanked all PIs for their work in moving money from multiple scopes into 128. For many years, trips in the Green River basin accomplished both nonnative removal goals and Colorado pikeminnow pop estimate goals. They were traditionally funded through nonnative fish scopes because the nonnative work continued every year. The disadvantage of this was not showing what we spend on Colorado pikeminnow estimates clearly. The goal was to ensure that CPM estimates are a priority and need to occur as a collective scope (instead of across multiple nonnative projects). The funding is essentially equal - just shifted among projects.

Highline Net - Will this net need to be replaced in the next five years? Dave recommended scheduling net replacement cost in an out year (FY21) in the current FY18-19 scope. >Change title on this scope to include all CPW nets on reservoirs. >CPW will revise this SOW prior to the MC meeting in August to include future net replacement.

Project 158 - placeholder for larval Colorado pikeminnow monitoring in Middle Green - report is coming from Matt Breen ASAP. Dave expressed support for the project as soon as the report is complete, but does the Committee recommend maintaining funding in FY18 if the report is still in review? Some of this information will provide key information in the assessment of flow decisions (e.g. experimental base flows). Block netting nonnative fish out of backwater habitats could prove effective at increasing survival of young pikeminnow (preliminary results indicate it can be), but Melissa questioned its applicability on the population level. The goal of the project was to assess the relative importance of flows and nonnative fish effects. The Committee recommended approving Tasks 1, 4, and 5 starting in 2018, but suggested another round of review / approval (after receipt of the final report) regarding Tasks 2 and 3.

Duschene NNF management - no new information is available from Mark Fuller about a potential scope. The Tribe may move forward with sampling with Mark's assistance without funding from the Program.

Yampa Fish Response (Proj. 140) - costs decreased due to completion of report writing in 2017. Angela will add the report to the list (*done*).

Propagation & Genetics

Ouray-Randlett - no scope of work is currently in place; Dave Schnoor is still working on it; this project is funded as a line item in the USFWS budget and is part of the USFWS contribution to the Program budget.

PIT Tags - new contract still under development at DOI level which will allow FWS to buy supplies directly. FY17 supplies will be obtained through a stand-alone order.

NEW - Translocation of humpback chub to Yampa Canyon - a conference call is scheduled for 7/24/17.

Monitoring & Research

NEW scope of work from UDWR - for floating antennas and razorback bar monitoring - Dave expressed concerns about effectiveness of floating antennas in deeper waters (RBS spawning occurs at or near peak flows). Members did support more wagon wheel/submersible antennas. Matt said the floating antennas would be used to guide placement of the submersible antennas, but submersible antennas could be used without the floating component. Tom Czapla expressed support for wagon wheels. Tom Chart asked if the scope could be written more generally (re: both target species and geographic location), e.g., target Colorado pikeminnow in tributary mouths (a la Vermillion Ck). Dale reminded the group that the antennas are often removed by people or moved by debris so replacement costs need to be included. Dave noted the need to coordinate with the similar USFWS scope of work (#169). Floating antenna data still has multiple problems, including species dynamics (predation) and shedding which cause problems with data interpretation. The Committee recommends funding the wagon wheel component only (~\$8500). >Matt will revise the scope to broaden the objectives to cover multiple species and multiple targets, add reporting requirements and delete floating antennas by August 10th. The BC recommends that all other field offices consider developing scopes of work for acquisition and use of antennas to increase coordination and eliminate duplication.

Dave asked if we can consolidate statistical consulting tasks performed by CSU from individual scopes (i.e. 131, 127, 163) to SOW 15 for LFL? >Dale's office will revise scopes of work to reference SOW 15 and Kevin Bestgen will revise SOW 15 to add costs.

Project 170 >Julie will add her contact information in addition to CNHP.

Deso-Gray HBC Monitoring - This scope is a placeholder because it essentially doubles effort from previous years. The Committee needs the most recent report in order to make recommendations on how this work will proceed.

Project 163 - Dave asked about the reporting schedule and Dale confirmed that the interim large-bodied report is due this year, the larval report will follow later. Tom Chart asked if it was possible to combine all life stages in a single document. >Dale will talk with Darek and report back.

Contaminants - Barb Osmundson is volunteering on this effort, she has completed a draft report and is working on revisions with reviewer. Travis Schmidt and James Roberts with USGS are continuing this work.

Dave asked that the Committee have a conversation in the future about wagon wheel antennas: how many we will need each year etc. We also need to close the loop on how to analyze this data and include it in other Program work. USU is working on some of this. CSU may have new information from the humpback chub estimate from 2016 in Black Rocks. >Angela will add item to future BC agenda.

Contingency List:

- a. FR-BW Synth - approximately \$41k for sampling larval pikeminnow in the lower Green River.
 - b. NEW - Matheson Capital and then O&M beginning in FY2020.
5. Report reviews (with Water Acquisition Committee participation via phone, 1 hour). *The Program Director's office has reviewed these reports, and Argonne has made editing changes that we believe improve the content, clarity, and usefulness of both analyses.*
- a. 'Backwater Synthesis - Physical' Report ("[Relationships between Flow and the Physical Characteristics of Colorado Pikeminnow Backwater Nursery Habitats in the Middle Green River, Utah.](#)") *The objective of this report is to identify the physical factors that affect backwater habitats and may influence annual recruitment of Colorado pikeminnow. A draft was shared with the technical committees in February 2016 (comments received from two peer reviewers, but not committee members). In 2016, the Recovery Program approved Bestgen and Hill's related synthesis of biological information evaluating long-term trends in reproduction, abundance, and recruitment of young Colorado pikeminnow in the Green and Yampa rivers. Together, these two reports provide information for the Program's ongoing evaluation of the Muth et al. (2000) Green River flow recommendations. Bestgen and Hill's (2016) conclusions and recommendation are discussed in this Argonne report.*

This report is relevant to the decisions currently under consideration by the GREAT. This evaluation looks at the variability in physical conditions that can be paired with the biological information provided by Bestgen and Hill.

The peer review draft went out in early 2016; the peer review comments and how they were addressed is now part of the report. The major comments concerned the following: The report assumed that the backwater and sandbar topography didn't change under a variety of flow conditions. The goal was to develop a snapshot of the topography to predict how they would change based on flow. A reviewer was concerned about the lack of hydrologic modeling, which would be optimal, but was not possible because they could not get staging information at each individual sandbar complex. The report addresses a variety of backwater situations including thresholds between no backwater at low flows, a connection and backwater development at higher flows, and then flow

through systems at even higher flows or backwaters that just increase in size with increasing flows. Reviewers commented on confusion in this section, which the authors addressed with additional text. Reviewers were concerned about regressions presented between Colorado pikeminnow populations and presence of backwater habitats. The authors removed this analysis from the report and referenced a paper from Mike Pucherelli in 1987 to develop a statistically significant relationship. The authors used an automated system to identify where and when backwaters would develop, reviewers requested additional information on how this model worked. Kevin Bestgen was concerned about analyst bias in various imagery datasets over time. The authors used ISMP data to compare patterns over time, finding a mean increase in the area of backwaters over time in both the imagery and the ISMP dataset, and more, larger backwaters. Melissa asked what the definition of a backwater was in terms of size or depth. Kirk said the first draft of the analysis had a minimum size of 30 sq m to be consistent with ISMP. The second draft considered all sizes and all depths of backwater areas based on the work done by Pucherelli (but this change did not affect the overall conclusion). Kirk acknowledged there may be a bias toward underestimation because it's easy to miss the smaller backwaters through imagery. Melissa asked if this could be the reason why the data is indicating that there are fewer larger backwaters now in comparison to more numerous but smaller backwaters in previous surveys. Kirk believes that the smaller backwaters are and were always difficult to detect and is confident that the conclusions are valid based on the data we have.

Kirk reviewed the summary of the report. They found a decrease in the number of backwaters, but an increase in the area of individual backwater habitats. This may be an advantage for fish as the larger backwaters are more buffered from changes in flow. The pattern may be caused by channel simplification and narrowing. The pattern also corresponds to a decrease in pikeminnow density. The analysis supports the recommendations in Muth et al. (2000) regarding stage height, timing of draw-down after larval drift. Recommendations from the report include: the importance of monitoring channel narrowing, continued imagery analysis (possibly every 5 years), and to monitor sand mass balance which would help determine how these habitats form. Sediment gauges have been added at both Jensen and Ouray to help with this.

Dave noted that the GREAT recommends new actions to try to increase backwater habitats, but this report indicates that backwaters don't limit pikeminnow density. Kirk explained that it's not the sheer amount of habitat available that affects pikeminnow, but that there could be a relationship in timing, specific location or other components that could be important. Dave is concerned that the sentences in the report that indicate that pikeminnow are not limited by quality or quantity do not clearly support the actions that are currently being contemplated by the GREAT. Kevin Bestgen clarified that it is a combination of biological and physical factors that comprise conditions that affect Age-0 survival (e.g., nonnative fish, antecedent conditions, and larval drift). Fish abundance is a function of flow, with higher recruitment occurring in moderate flow years. We are unable to identify particular mechanisms that we can pull out of the complicated system, but we are reasonably confident that we are able to produce stronger year classes of pikeminnow using particular flow conditions. Dave noted that Kevin is recommending

flows of 1700 to 3000 cfs, yet Kirk's report shows advantages over 3000 cfs to maximize volume and depth. Kirk explained the recommended range is wider, but that at 3000 cfs backwaters do not disappear. >Kirk agreed to look at that sentence (that speaks to 'limiting factors') again and revise it to make sure it does not overstate or understate a conclusion and email changes to the group. >Jerry asked that the importance of 0.1 stage be added as an important conclusion.

>The revisions will be emailed to the Committee within a couple of weeks (Friday, August 4) for e-mail approval.

Dale acknowledged that while the report is well-written, it also presents conundrums that likely cannot be resolved with existing information.

- b. The '2016 Floodplain Connections' Report ("2016 Reassessment of Floodplain Wetland Connections in the Middle Green River, Utah"). (Sent to the Committee on June 21, 2017). *Objectives of this report include determining the minimum flows that connect floodplain wetlands to the main Green River channel, allow for entrainment of larval razorback suckers, and allow for passage of adult razorbacks, for those wetlands/breaches that presumably connected with the river during the relatively low-magnitude peak flows of 2015. The tech committees recently approved 2012 and 2014 versions of very similar surveys.*

Tom Chart noted that this is the third report in this series, and that these efforts were funded by WAPA outside of the Recovery Program. He invited discussion of any part of the report, and said WAPA and the Recovery Program were seeking final approval / endorsement on this report. Kirk noted that duration of connection was added to this report. The Committee approved the report.

Kirk is currently working on building a relationship between satellite imagery and 0.3 m deep backwaters confirmed by ground truthing. They have surveyed over 30 backwaters (18 in Ouray reach) using sonar and backwater edge information to develop digital elevation models for each backwater and will have photos taken in August for comparison. Kirk hopes to survey as many as 50 backwaters. The satellite data will be very high resolution at specific flows and is being taken specifically for this effort.

6. Razorbacks in Sheppard Bottom – Tildon reported on presence of YOY razorbacks in Sheppard Bottom (which can't be drained). Unscreened Pelican water can be moved into Sheppard where the fish are located to maintain water quality. The main question is whether to supplement water through summer (beginning to mid-August) and then try to capture the fish with nets in September/October and return them to the river or to try to overwinter them and hope they move back to river through the breach or downstream end when it reconnects in the spring. Tildon can't yet say which might work. To supplement water, they hope to be able to screen the Pelican pipe with a 500-micron net of Reclamation's currently located in Durango, but if they can't do that, then nonnative fish could enter Sheppard (and potentially get back to the river when Sheppard reconnects). Tildon is uncertain about whether fish would successfully overwinter. Open water is limited. Tildon will need to further survey the

site. Kevin McAbee asked about options for managing the Sheppard units to manage nonnative fish; Tildon needs to look into this. Tom asked how overwintering fish may affect the ability to entrain larvae next year. Tildon clarified that razorbacks appear to only occupy the portion of the wetland between the river breach and the fish exclusion screens. The water quality in the managed portion (our targeted area) of Sheppard deteriorated quickly this year and does not support fish. Therefore our managed units (S3 and S4) should be available for larval entrainment again next year. Tildon welcomes suggestions from the Committee on how to manage the situation this year. Melissa recommended overwintering the fish, if possible (since we're still trying to learn more about how to do that). Tildon agreed this would be the simplest approach. Kevin Bestgen suggested Tildon do some sampling to get an estimate of the number of razorbacks either way, because we would need some idea of fall densities to evaluate overwinter survival. Tildon agreed that they want to track these fish through time. >Tildon will keep the Committee informed and seek further input, as needed.

7. Review previous meeting assignments – See Attachment 1.
8. Review reports due list - The Committee reviewed and updated list.
9. Schedule next webinar or meeting and identify agenda items – Webinar - Friday October 27, 8 am-12 pm. Agenda items likely will include discussing floodplain prioritization. The next in-person meeting will be January 25 in Vernal. >Tildon will try to reserve the UDWR conference room. Possible future agenda item: Discussion regarding wagon wheel antennas - comprehensive discussion around how many we will need throughout the program, where they should be put and how to analyze the data.
10. Consent item: Review and approve May 23, 2017, Biology Committee webinar summary – *A revised summary was sent with this agenda. BC approved. >Julie will post to website. Done.*

ADJOURN: 12:10 p.m.

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 (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.

2. Regarding white sucker hybrids, **Harry Crockett** will talk to **Kevin Bestgen** about any further work needed subsequent to the identification guide that Pat Martinez distributed last year. *8/26/14: Ongoing (very complex issue that really deserves a combined genetics and morphological study). This could be put into the next round of Program Guidance (PD's office did) and we should be considering potential outside funding sources, as well, since this relates to more than listed fish. 1/13/16: The 2016 Colorado-Wyoming AFS meeting will have a dry lab workshop on sucker identification and hybrids. Kevin Bestgen recommends a genetics study linked to a morphological study. 3/11/16: The 2017 joint meeting of the CO/UT/WY AFS chapters may be appropriate for another mini-workshop on identifying*

hybrid suckers. 8/22/16: Some support from the AFS chapters/members may be needed for Dr. Bestgen to lead this; Harry Crockett will discuss with Kevin Bestgen. 1/12/17: Harry said AFS doesn't want to include this as part of the continuing education this year. Krissy asked Ed Kluender if LFL would be willing to offer a workshop for UDWR, Krissy will explore travel options (Colorado and others would want to participate if at CSU). >Kevin Bestgen will consider combining this with a fish identification workshop and establishing this as a registration-based class (hopefully annually). Wyoming has asked for a class in mid to late May or early June. Utah biologists also would like to get this training, but that timeframe may not work. 5/23: Bestgen set up a class in Fort Collins for Wyoming G&F June 7 & 8. Short-course training was completed for both CO and WY staff. Documented increase from 40-80% correct ID for inexperienced people for the plains fish species class. Experienced people also improved markedly after training. Training will continued to be offered. Interest was expressed somewhere on the West-slope, potentially in April before fish season started. Tildon expressed interest in additional small-bodied fish identification as well. >Kevin Bestgen will add this to a SOW for regular classes, potentially with both a Ft Collins class and a road-show. Complete, to be removed after this summary.

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 Czapl**a 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 Czapl 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 Czapl**a will coordinate a call to strategize bonytail stocking, starting with the group currently convened to discuss stocking locations. Interested Committee members should let Czapl know if they'd like to be part of that discussion. A conference call was held on July 11, 2017. >Tom Czapl will get a summary out to the BC next week (July 17-22).
5. The Committee endorsed an experiment to tag smaller hatchery razorback and bonytail (for fish coming out of floodplains); >**Tom Czapl**a will investigate which hatchery could do this. **Tom Czapl**a 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 Czapl**a 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

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 Jerrad's surveys with the Provo office and continue discussions.
 - **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.
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.*
 - The **PDO** will ask the **San Juan Program** to respond similarly. >Nate Franssen will request this information from SJ Program stakeholders at their February 21 Biology Committee meeting. Information pending. *Scott Durst reports that in San Juan County, NM there have been 22 carp imported since 2006. The tribes did not report on their activities. See May 2017 BC report for more detail.*
 - *7/14/17: Current data shows 4 of 4 diploid fish. Utah and FWS-GJ will explore options for additional sampling next year (ie light-trapping). PDO has provided new information to WAFWA and the Fish and Wildlife Council, and was raised at the State-Fed coordination meeting. Kevin McAbee said blood samples are easier to analyze for diploidy so we could switch procedures to be able to conduct both diploid/triploid test and DNA analysis on the same sample. Kevin will continue to assess. Complete for now, delete after this meeting.*

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. 7/14/17: Dale will ask if Barb is willing to distribute it to the BC with the caveat that it will not be released.*

10. **Julie Howard** will revise the Deso/Gray humpback chub report, respond to comments, and send these documents to **Tom Czapl**a 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. *7/14/17: Revisions are pending from UDWR-Moab.*

11. FY18-19 Work Plan:
 - Agreement number for Sediment Monitoring (85f) - Agreement # R17PG0047 needs to be added to the SOW. *Done.*
 - **Julie Stahli** will add contact information in addition to 170 - CNHP. *Done.*
 - **Dale Ryden** will revise scopes of work to reference SOW 15 (*Done*) and **Kevin Bestgen** will revise SOW 15 to add costs.
 - **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.

12. **Kirk LaGory** will revise Backwater Synthesis report and will provide to the BC for email approval in early August.