



Final Summary
BIOLOGY COMMITTEE MEETING
16 May 2017
Fort Lewis College
Durango, Colorado

Attendees

Biology Committee Members

Bill Miller – Southern Ute Indian Tribe
Jacob Mazzone – Jicarilla Apache Nation
Brian Westfall – U.S. Bureau of Indian Affairs (BIA)
Jason Davis – U.S. Fish and Wildlife Service (USFWS) Region 2
Mark McKinstry – U.S. Bureau of Reclamation (BOR)
Benjamin Schleicher – USFWS Region 6
Vince Lamarra – Navajo Nation
Mike Ruhl – State of New Mexico
Harry Crockett – State of Colorado
Tom Wesche – Water Development Interests
Robert Findling – Conservation Interests
Craig Townsend – U.S. Bureau of Land Management (BLM)

Coordination Committee Members

Dale Ryden – USFWS Region 6
Brent Uilenberg – BOR
Katherina Diemer – BLM

Peer Reviewers

Presence was not requested

Program Management

Sharon Whitmore
Melissa Mata
Scott Durst
Nate Franssen
Eliza Gilbert

Other Interested Parties

Matt Zeigler – New Mexico Department of Game and Fish
Roland Becenti – BIA
Tracy Diver – USFWS Southwestern ARRC
Steve Platania – ASIR (American Southwest Ichthyological Researchers LLC)
Mike Farrington – ASIR
Howard Brandenburg – ASIR
Bobby Duran – NM Fish and Wildlife Conservation Office (NMFWCO)

Weston Furr – NMFWCO
Kim Yazzie – Navajo Nation Department of Fish and Wildlife (NNDFW)
Jerrod Bowman – NNDFW
Scott Clark – University of New Mexico (UNM)
Tom Turner – UNM
Brian Hines – Utah Department of Wildlife Resources
Daniel Lamarra – Environmental Research Institute (ERI Inc.)
Carrie Lile – Southwestern Water Conservation District, Colorado
Susan Behery – BOR Upper Colorado Region
Ron Bliesner – Keller Bliesner Engineering LLC
Matt Owens – PNM Resources
Alex Birchfield – U.S. Office of Surface Mining Reclamation and Enforcement

Tuesday 16 May 2017

Introductions and changes to agenda –

Added items:

Interim flow operation process adopted during 2015 flow workshop

Projects which will not be presented upon during annual meeting

Statement of work for NMFWCO remote biologist

Update on Lake Powell captures

Update on 2017 nonnative removal efforts

Process through which Utah can become a member of Coordination and Biology committees

Planned 2017 Navajo Reservoir spring peak release presentation moved to morning

Review of Action Items from 21-23 February meeting

- A draft Razorback Sucker augmentation plan was sent to BC members for comment. Wesche and Ross have provided comments. Analysis of experimental stocking procedures will be conducted in late 2017– early 2018.
- New Mexico is working the revised stocking procedure through its administration. Colorado would have to process the revisions through their administration once received from New Mexico, but no issues with revisions identified. The stocking procedures agreement, begun in the early 1990s, should be approved by 2023.
- BIA is working with U.S. Geological Survey (USGS) to finalize a Razorback Sucker (Razorback) selenium effects study. With BIA's permission the draft plan could be released. Pertaining to mercury, the Program Office (PO) is developing a study plan with USGS to assess impacts to Colorado Pikeminnow (Pikeminnow). This is part of the mitigation for the Four Corners Power Plant operations listed in the Biological Opinion.
- Benchmarks for recovery have been incorporated into the Pathways document and benchmarks may be incorporated into the revised long range plan (LRP)
- LRP status updates were provided by most Principal Investigators (PI) and revision of the LRP is underway. If approved by the CC, the LRP will become a separate document from annual status updates. The revision process should be concluded by the 2018 annual meeting.
- Funding of STReAMS could occur through a statement of work process. Whitmore will follow-up with the UCRIP Program for their expectations.

- The PO is working with Colorado Water Conservation Board to upload all SJRIP documents to their searchable Laserfische platform. This includes determining what metadata is needed for each document. A webinar with platform hosts will be scheduled for the near future. Once the Laserfische platform is populated with SJRIP publications a PDF will be provided that explains to SJRIP participants how to use the platform.
- Action items already on the agenda are: revision to the Pathways document, revision to Colorado Pikeminnow Stocking Augmentation Plan, and disposition of Razorback Sucker too small to be stocked (i.e. <300 mm TL).

Approve draft summary from 21-23 February 2017 BC meeting

- Comments received and incorporated from Townsend, Wesche, McKinstry, and Zeigler. There were no additional comments. *Davis motioned to approve the summary; Mazzone seconded; the summary was unanimously approved.*

Planned 2017 Navajo Reservoir spring peak release – Behery

- The forecast for the available water calculation and peak release evolved over the winter and spring using a daily precipitation model from Colorado Basin River Forecast Center starting in December 2016. By May 2017, variability was reduced and the forecast leveled out to ~100% of average. Snow telemetry (SNOTEL) indicated a peak at 120% of average but there were also record high temperatures during winter and early spring months.
- This year's spring peak release began on 3 May 2017 with 488,000 acre feet of available water. The plan being implemented is a 16 day ramp up to 5,000 cfs release. The same criteria for ramp down will be used as last year (whichever occurs first: release all available water, i.e. 35-days at 5,000 cfs in 2017 or the mean daily flow at Four Corners measures < 6,500 cfs indicating the Animas River spring peak was "spent"). Ramp down is planned to occur around 23 June. Realized flows are as planned, except for 10 May when a large storm over Largo Canyon was predicted which had the potential to input more water than safe channel capacity of 5,000 cfs, given Navajo Dam releases. Thus flows were reduced to allow for storm runoff – the storm did not materialize and flows from Navajo Dam were increased after the weather system passed.
- Dam checks – the 4x4s require inspections after 14 consecutive days of operation but only take one day and the release is reduced by < 1,000 cfs. Operations have been managed so the 4x4s are not used until necessary. Thus there will only be two inspections during a peak release. After 30 days of consecutive use, the hollow jets require inspection. Larger flow reductions must occur and the inspection is a week. BOR is managing operations so that these inspections will only occur after the peak release, during ramp-down.
- The Animas River peak is forecasted for late May to early June. Recent projections have 50% exceedance by the end of May to early June. Modeling of the Animas is difficult as little is understood of this watershed and modeling is based on climatology. Flows in the San Juan River over 8,000 cfs at Four Corners are mostly dependent on Animas River run off.
- The flow statistic chart was updated from February's meeting. Flow targets for 2017 will likely be met for the 5,000cfs (48 days) and 2,500 (80 days) benchmarks but uncertain for 8,000 and 10,000 cfs targets because reaching those benchmarks rely on Animas runoff.
- Public outreach included mailing of 5,000 postcards, informational meetings, community notices (newspaper, radio [first year on radio], TV, email lists, website), informational cards

passed out to businesses in Farmington for distribution to their patrons, and information uploaded to Farmington social media sites.

- At this point, areas along the river that flooded in 2016 have not done so. The 2016 release may have changed the river's morphology resulting in reduced flooding in 2017. A private property river crossing to an island was constructed in 2017 just below the dam. BOR became aware of the river crossing in March 2017. The river crossing was permitted by Army Corps of Engineers and San Juan County years prior. The property owner was notified that flows in the river can reach up to 5,000 cfs and equipment would need to be readied to remove debris should the crossing start to fail due to flooding. The crossing was designed to withstand 500 cfs and when flows reached ~1,000 cfs, the crossing started to flood, backing water up on into neighboring properties. BOR and San Juan County officials helped the owner remove the crossing when it became a public hazard. Bridge debris in the river is being monitored to insure it does not cause downstream issues. BOR communicates with San Juan Office of Emergency Management every morning and no other issues have been identified which would preclude a 5,000 cfs release.
- The planned end of water year elevation for Navajo Reservoir is ~6,050 feet allowing for a 35 day release of 5,000cfs.

Discussion on interim flow operations and process – added agenda item

- Interim guidelines were developed during the first flow workshop which included a process to involve the BC in decisions on how water should be released but the process was not followed in 2017. A request was made to review the interim guidelines and follow that process until revised Navajo Dam Operations Procedures for the San Juan River are finalized. BOR and PO said they would review the interim guidelines and make sure they are followed in 2018. Available water calculations were sent to PO but those had not been forwarded to the BC.
- Bi-weekly public phone calls are available. The conversation consists of weather forecasts and how flows are proceeding.
- The updated Navajo Dam Operations Procedures, based on the second flow workshop, is in draft form and will be finalized once the hydrology model is run with current depletions rather than full development as is currently modeled. BOR is waiting to get those model runs from the Colorado agency that runs the model. The requested model runs should be delivered by the end June. Questions were raised as to what data were considered as “current conditions” for depletions in the model runs. It was thought BOR or those responsible for the model had information on current depletions.

Discuss draft recommended FY 2018 Annual Work Plan – Program Office New schedule for AWP development – Whitmore

- The 2017 SOW submission and review timeline was moved up to allow for technical review of SOWs prior to the Coordination Committee's (CC) May review of the draft Annual Work Plan (AWP), which had not been done in previous years. The PO solicited input from the BC in regards to how this process should be conducted.
- SOWs were sent to BC on 9 March and reviews were submitted back to the PO by the 30th. The PO then combined reviews and sent those to PIs for response and/or incorporation into SOWs. Those responses and incorporations were returned to PO from PIs by 1 May and the draft AWP sent out to BC and CC by 8–10 May. The AWP sent to BC members only

included technical SOWS that were reviewed by BC and peer reviewers. The Pls' responses to comment were also included in the draft AWP.

- Each SOW was reviewed by two peer reviewers.

Program Document modification limiting conflicts of interest – Whitmore and Miller

- A second process for AWP development is the incorporation of guidance from the CC pertaining to conflicts of interest. Guidance from the CC on this topic was requested by the BC. A subgroup of the CC is developing language to revise the Program Document to reflect their guidance. The subgroup will suggest revised language to the Program Document after this year's new AWP process cycle has had a chance to be completed. In regards to this guidance, the CC subgroup is considering clarifying who can prioritize and recommend projects for funding.
- For many years the BC has recommended which SOWs go forward for funding and the PO then implemented those recommendations. The CC subgroup's concept is for BC members to provide a "technical" review only, with no recommendations. This may reduce concerns about BC conflicts of interest.
- In response to CC guidance, the SOWs that were sent to BC members this year did not include budgets and were only SOWs that required a technical review. For example, NMFWCO had a SOW for a remote biologist which would be stationed in Farmington. The PO determined the SOW was not technical in nature. Thus the PO did not solicit comments from the BC or peer reviewers for that SOW.
- The CC received a draft AWP that included the SOWs which received BC technical review and all other SOWs as well as all associated budgets.
- It was suggested that review of a budget by BC members can have technical merit as it allows for a better understanding of the project. The cost of a project may justify an increase in the technical scrutiny, i.e. nonnative fish control or larval fish monitoring. Both pieces of information may be needed to make a decision on the value of the overall project.
- How is the BC supposed to provide its technical considerations when there is a budgetary need to reduce effort from one SOW for implementation of another SOW? For example, if there is a project on McElmo Creek and larval fish monitoring cost ~\$300,000 how should BC determine if larval surveys should be reduced to allow for a study in McElmo? The PO should prioritize which projects it would like to have a SOW submitted. Those would receive a technical review from BC, the PO then compiles a draft AWP, and if there are issues that require further technical consideration the BC should be engaged by the PO. The request to the BC in such an instance would need to be worded as a scientific question, i.e. "What is the tradeoff...?". This would remove BC members from making a "recommendation". The PO would like to be able to ask the BC for a "technical recommendation".
- Even without a budget, a technical review could be biased. Over the last two years, the process set out by the PO for SOW review has resulted in higher quality reviews and encouraged each BC member to provide input. When comments are purely technical, it is easier to identify bias. Federal employees are required to take scientific integrity training and the San Juan Recovery Implementation Program (Program) has a good track record of integrity and scientifically based decision making.
- If a SOW is not written with enough detail to assess the quality and quantity of work, then it is not a sufficient SOW. Cost should not be a surrogate for effort. From a technical

committee (i.e. BC), reviews should be done without knowledge of budgets and budgets are not necessary to conduct a review. Budgets may be needed for competing scopes but that decision would be the responsibility of the CC.

- The CC sub-group is considering the definition of “financial gain” but an example of “conflict of interest” is monetary or employment benefits, status as PI, or supplying staff.
- The previous Program Document could lead to an interpretation that would restrict technical reviews to only those BC members who do not receive program funds. This would leave few BC members available to make comments. If the Program starts restricting who on the BC can make technical reviews other issues will likely arise. The PO believes that once budgets are removed from a SOW any BC member should be able to review it. If BC reviews are kept to a technical review, the entire BC could provide technical comments but that language is still under discussion. The PO wants any new language to continue to allow the PO to fully utilize the BC.
- The Program Document says the BC should not have a role in prioritization. If a BC member has concerns over SOW prioritization then they should speak with their CC representative.
- The BC should wait on language to be drafted by the CC before discussion continues. The language pertaining to conflict of interest is only relevant to the AWP.
- The CC is also responding to the BC’s request to clarify the BC Chair election and term limit process. The draft language states that the BC Chair would be elected in late fall and commence duties with the new calendar year. The term would be two years and no consecutive terms served. This would allow for three different BC Chairs through to 2023, the sunset of the cooperative agreement for the Program.
- The Chair requires some additional investment of time and leadership. Requiring the BC Chair to change every two years may result in outcomes that are not necessarily desired. Serving as BC Chair requires support of respective CC member. Current responsibilities of BC Chair are not as demanding as in the past. The current work load is reviewing and commenting on agendas.
- It may be beneficial for the Chair to be a nonfederal partner. It is more influential to have the BC Chair go to DC annually and a federal employee is not allowed to participate in those trips. The CC has had a federal employee as chair. The pool of possible BC Chairs is cut in half if federal employees are not considered. The CC should include language to allow a second consecutive BC Chair term should no BC member volunteer for the position.
- The CC will continue the discussion during their meeting.

Compiled reviewer comments and responses to comments

- The process resulted in more and better feedback than in previous years. The SOWs that were revised based on technical review were improved.
- The AWP is currently in its first draft and will go to CC for discussion as well as the new process. The AWP is currently over budget and work is needed to reduce costs of all SOWs recommended by the PO to the CC for funding.
- The proposal to sample Colorado Pikeminnow in the spring needs technical review as it was submitted after the comment process had been concluded.
- SOW reviews could be streamlined. If no changes are made from one year to next, the BC does not need to review that SOW (e.g. augmentation, hatchery production, monitoring). Reviews should be required for new SOWs but there should also be the opportunity to review consistent projects. Especially if they include substantial modifications. For instance, the

2018 small-bodied monitoring SOW incorporated changes to the study area and an assessment of this should be conducted (i.e. compare it with the 2012 Monitoring Plan). If the process is streamlined the reviewer's form with all SOWs should be maintained with new SOWs highlighted.

- The SOWs themselves could be streamlined by removing repetitive history and background. This information could be incorporated by reference, or into a section of the AWP, or the Monitoring Plan and Protocols rather than in each SOW.
- It needs to be determined how and when to end the cycle of comment, revision, and response. The PO does not want to be in the position of making the determination as to the adequacy of a comment, revision based on comment, or response to comment because this could be a never ending process. Comments and opinions among reviewers and the PO are not always consistent. Incorporation of peer review comments into revised SOWs that are in the draft AWP was variable. Overall PIs made adjustments where appropriate and it is the PI's purview to disagree with a comment.
- How did PO make final decision on which SOWs were incorporated into AWP as some technical suggestions were made but did not appear to get incorporated into final SOWs? There was one SOW that received BC technical review which was not included in the AWP (i.e. relationship between small-bodied juvenile fishes and habitat). BC technical review of this SOW was considered in the PO's decision: the BC technical review identified the SOW as data integration and there are other SOWs for that, the proposal was redundant to work previously conducted, the linking between flows and habitat has yet to be determined, it was perceived as low priority, analysis could be done at a later date, and few endangered fish have been collected to date so the result would not help in recovery of those species.
- What should the procedure be if a PI does not respond to technical reviews? Maybe the PO should put the project on hold. If it is a project the Program has been supporting for multiple years the PO did not think a lack of response to technical comments was a reason to automatically withhold funding (example given was Southwestern ARRC, to whom this process was a new obligation and not anticipated). The PO does not want to be in the position of making or appearing to make subjective decisions.
- Individual BC members who made comments should review the responses to their comments and determine if the response was sufficient.
- For habitat monitoring, the PI is working on a path forward in conjunction with the PO.

Projects that will not have a presentation during annual meeting –added agenda item

- No report or presentation on BOR's funding for additional measurements from USGS stream gages has been provided. The project will be recommended for 2018 funding and a report or presentation will be requested.

Statement of work for NMFWCO remote biologist – added agenda item

- NMFWCO previously had an employee stationed in the Four Corners area. The position has been vacant for several years and the new SOW would serve to rehire a locally based employee. The employee would help with a variety of projects including nonnative removal, NAPI ponds, PNM fish passage, provide for a person who knows the river (i.e. possible boat launch and takes outs), be available for all Program participants, and help maintain PIT tag antennas and data. The employee could also help with operation of Hogback Canal, Fruitland Diversion, the Navajo Nation projects, assist with vehicle shuttling, and could interact with

activities pertaining to Navajo Gallup intake. The proposal is for this employee to assist with NAPI pond management not take it over. The SOW was loosely written because all work responsibilities have not been identified. The position is proposed as a term GS7-9. This SOW was not reviewed by the BC because it is a budget and personnel matter but was brought to the BC at this meeting for any technical consideration the BC may have.

- The position was previously funded out of NMFWCO SOWs (i.e. nonnative removal, augmentation) but is now a separate SOW to provide for greater flexibility. If NMFWCO just increased costs in their SOWs, it would restrict that person's activity to those SOWs.
- The PO has the capability to provide assistance although that staff is based in Albuquerque.
- Work would need to be done to determine how to prioritize the employee's responsibilities and how that would fit into Program needs.
- The Navajo Nation indicated such a person would be useful as it would cut down on the workload they currently have. The previous employee frequently assisted the Navajo Nation.
- Would this create savings in other SOWs? Will the projects that get help from this prospective employee put that in their SOW as staff time they do not have to pay for? Would it help reduce the cost of nonnative removal? It would be problematic to cut funding from other projects because this person would have roles that would be undefined. The Program's budget will not be increasing so funding this position will require removing support from other projects. The PO would have to identify projects to which funding would be reduced to support this SOW. Funding will be a PO and CC decision. NMFWCO had reduced their individual SOWs that had supported the position but that money has since been reallocated.
- In the Upper Basin, agencies have offices along the river or close by. Other than Navajo Nation and BLM, Program participants do not have a presence in the local community. A person in the area could be beneficial to all projects.
- The previous employee had many advance skills. Some on the BC questioned if an adequate replacement at the GS 7/9 level could be found.

How to fund high priority recovery activities in FY 2019 and beyond?

- The issue is about a lack of ideas. The Program can free up money but there are few ideas which have the potential to result in management that affects recovery. We are moving towards recovery slowly. We need project ideas that lead towards recovery implementation.
- During the Program's history unsolicited projects were not supported. Money was considered fairly tight and there was no reason why a project proponent would invest in project development. This may have been more to do with the entity proposing the project as it is difficult to fund non-governmental agencies. The PO would like to receive unsolicited proposals, if there are good ideas. If the CC decided within a fiscal year to defund nonnative removal, the Program has few projects to fund that have a management implication.
- Historically, the Program has been less supportive of "research" which is why there is a lack of ideas. Recent data integration efforts have moved the Program towards funding research directed towards management. The program needs to focus on developing new management actions that move us closer to recovery.
- The Monitoring Plan and Protocols restricts "outside of the box" thinking as efforts have to fall within a certain framework. The Monitoring Plan and Protocols should be reviewed to determine if they are functioning and what needs to be improved.
- Monitoring alone is not helping recovery; we need to develop projects that are oriented towards management actions that help recovery. When we talk about what we are doing for

recovery it is flow, nonnative fish, fish passage, and stocking. Habitat restoration work to date has not been funded by the Program.

- Management actions need to be conducted so they can be measured. Monitoring in place is not present in the Upper Basin and that program lacks the ability to measure the effect of their management actions. The Program should safeguard its monitoring activities. There are ways to reduce monitoring and still maintain the ability to measure the system's response to management actions.

Additional discussion

Continued discussion of new SOW

- After a subgroup of the BC met to consider ways to revise the Pikeminnow stocking plan, NMDGF and NMFWCO, put a scope together to assess the interaction of wild and stocked fish by examining the effect of density on body condition. The proposal would also assess calcein mark retention and accuracy of field identification. All backwaters would be sampled in the spring, block netted, and young of year Pikeminnow sampled.
- Concern was expressed about removing all Pikeminnow captured. The purpose of taking Pikeminnow is to verify calcein marking and conduct an accurate lipid analysis instead of relative mass. It is difficult to make accurate measurements of relative mass in the field.
- If Program wants to use calcein as a marking technique it will be important to determine to what extent the calcein mark can be accurately detected in field conditions. BIO-WEST used calcein. That effort was not successful. Catching fish and validating the mark is important.
- The primary question of this study is designed to answer is whether Pikeminnow density in backwaters has an effect on condition and whether there is a difference in condition depending on the composition of wild versus hatchery fish in that backwater. This is an information gap the BC has considered important.
- The proposal could be revised to subsample backwaters or limit take of Pikeminnow.
- Some assumptions made may not be well supported. One is whether the fish community is static and not moving in and out of backwaters. BIO-WEST study should be reviewed. Whether habitat is static may need to be considered more thoroughly too.
- Determining if Pikeminnow in a backwater are all wild or stocked fish could help address whether one is out competing the other. The study is designed to help address whether there is a negative interaction between wild and stocked fish.
- Can wild fish be differentiated from stocked fish based on size? The April 2017 larval monitoring effort resulted in capture of more Pikeminnow than in prior years and some fish were 28-29 mm in standard length. These may be wild fish based on size and occurrence following known documentation of wild age-0 fish in 2016. Otherwise, the assumption would be that only the smallest of stocked fish survived. A histogram might indicate whether there is a difference between size of fish that are stocked and those that are likely wild. Size ranges provided by Southwestern ARRC may be a median from a sample of 20-70 fish. Fish produced from Upper Basin hatcheries are highly variable in size. Captures of Pikeminnow from the Phase II sites showed a lot of variability in size and the assumption was that these were hatchery fish as Phase II is upstream of mostly likely spawning areas 2016 fall captures. In 2006 and 2007 larval monitoring caught Pikeminnow considered wild because they were very small. After researching the size of hatchery fish stocked it was likely these were stocked fish and there was little larval production in those years. This is an example of why it

is important to know size of fish stocked and to have all stocked fish marked prior to releasing them.

- The small Pikeminnow captured in April 2017 might have been spawned in late summer or fall. There has been speculation that these fish might be wild fish.
- It is a good idea to at least measure the density of Pikeminnow for each backwater and attempt to understand how many fish are supported by that specific backwater.
- Technical comments should be submitted soon and a request was made for BC members to comment on collection of Pikeminnow (i.e. whether subsampling should be done or suggest an acceptable number to be retained). The proposal was also to conduct the study throughout the entire river but that can be adjusted too. The number of Pikeminnow collected will likely be a small percentage of the fish that are actually in the river. Subsampling is likely more palatable. For example recruited wild young-of-year are more valuable than wild larvae.
- The study was developed because of the BCs discussion and concern as to whether or not stocking is having a deleterious effect.
- Even if all the fish collected are hatchery fish, this provides information on density and condition after stocking and data on retention and identification of the calcein mark.
- Southwestern ARRC suggested wire tagging would result in unacceptable levels of mortality.
- A subsample of stocked fish could be VIE marked and when captured in spring it can be determined if the calcein mark applied to all fish lasted through winter and is still readable. VIE tagging is an additional handling event and would confound survival and condition.
- Pikeminnow stocked in 2017 will be calcein marked but stocking number will be temporarily reduced to 200,000 from 400,000.

2017 larval sampling

- Larval monitoring is being extended upstream in 2017 and the trips are scheduled to sample for Razorback Sucker. Should one of the trips be shifted to target Pikeminnow, i.e. move a trip to the 3rd week of July as Pikeminnow spawn on the descending limb of the hydrograph which will be around July 4th? Larval Pikeminnow were captured as far upstream as Hogback Canal in 2016 during an assessment of entrainment at that facility. It is assumed that 2016 spawning was a response to high flows and since there will be high flows again in 2017, a reproductive response is expected. Pikeminnow appear to have a short spawn period so there is a risk, the week chosen for sampling, will not result in captures. The sampling week should be decided based on environmental factors like flow or temperature. Moving a trip would be budget neutral. There will be no impact to data continuity as this is the first year of sampling higher in the river.
- It may be worthwhile to think about larval sampling in a more experimental approach. For example what is the composition of larvae below waterfall? Are larvae being lost over the waterfall? Is the annual data collected during monitoring being used to make decisions? Are there other pieces of information that could be gathered?
- *McKinstry motioned to move one of the three upper section trips, based on an environmental factor, to target collection of Pikeminnow. Seconded Ruhl. Unanimous approval*

Miscellaneous

- The Relationship between small-bodied juvenile fishes and habitat SOW which was not included in the 2018 AWP will be included as an unfunded project so idea does not get lost.
- The CC might want justification as to decisions made for SOW inclusion into AWP.

- BC members will review AWP and in particular PI responses to their comments on revised SOWs. BC members should submit their assessment of PI's response to their comments to PO by 30 June, ending the SOW review process. Once determined, the revised review process should be described in the AWP.
- The PO could develop priorities as early as the fall and start receiving scopes earlier than March which would help the timeline of process. This could allow for SOW place holders to be presented to BC during winter meeting.

Phase 3 habitat restoration update – Findling and Bliesner

- Phases I and II were developed to provide refuge for larvae and small bodied fishes. Phase III is proposed as a response to an identified need to create additional nursery habitat. The proposal is to establish a wetland environment that includes the ability to entrain and release larval fish. TNC and Keller Bliesner Engineering worked together to explore the concept. The project is to establish a proof of concept. The BC would then evaluate whether similar habitat work should be done and which design, Phases I and II or Phase III, would be most appropriate to support recovery. Phases I and II require little maintenance. The Phase III design concept would require management. In addition to dealing with sedimentation issues there would be an inlet/outlet and this would require a person to open and close gates.
- Reaches 3-5 were evaluated to identify all secondary channels that flow at base flow and were historically stable. The 1997 fall habitat mapping, 2015 lidar, and 2016 river photography was used to determine this and whether a 3-3.5' slope was likely present. A riffle in the main channel was used to indicate a drop elevation and lidar was used to confirm slope differences. A total of 16 sites were identified between RM 71 -135. Five were removed from consideration because the change in elevation was <3-3.5'. Two more sites were removed because of inaccessibility or quantity of maintenance required.
- Nine sites were then assessed for wetland placement and cost. Seven sites were visited and two selected with four sites identified as future possibilities. The cost estimates were similar among the nine sites ~\$350,000 but RM 123 would require additional maintenance. Efforts to make the property at Recapture Lodge (RM 79) viable were not successful even though the owner is very interested in participating in recovery actions. The site at RM 107 was carried through to concept design and is 2.1 acres. This site is remote, on Navajo Nation land, and has a locked gate on it. The site at RM 109 is higher in the river, is difficult to access but that could be resolved. This site is less desirable because of the maintenance work need at the inlet but otherwise the site has a good elevation drop of 5'. The site at RM 122 is on river left below the Four Corners Bridge. It was not flowing during the site visit and maintenance would be involved to keep silt out and water in. RM 127.2 is one of the Phase I sites. The inlet would require continual maintenance and it does not have much drop in elevation. RM 134.3 is a good site except for the inlet and consistent flow is questionable. RM 135, a Phase II site, is next to a road. This is a good site except for marginal elevation differences and security would be required (fencing cost of ~ \$140,000). Functionally this is the best site except for security. RM 107 has been flowing for 10 years and is the proposed site. A backwater would need to be built at bottom.
- Inundation of the wetland was designed to occur from the upstream end. A minimum change in elevation was established as 3-3.5'. This would allow for inundation to be maintained at SJ base flow at a predetermined depth. When the wetland is drained, fish will not be stranded,

and draining will not be too rapid. The inlet structure would be 4' and harvest kettle installed. An embayment created at the top will provide larvae habitat to become entrained in the inlet.

- Annual maintenance costs at RM 107 would be ~\$10,000/year; RM 135 \$11,000/year. RM 107 could be operated for 10+ years likely without sediment issues.
- Suggestion of wetland operation was to be based on hydrograph and consideration of spawn dates. The inlet control gate could be closed once larval drift ceases each year.
- There are no current plans to screen out larger fish. A screen would likely require daily cleaning and increase operational costs. Draining the wetland at end of year may help preclude establishment of nonnative species. In the Upper Basin nonnative fish become established in the wetlands. Channel Catfish is major adult predator in the SJ. The Upper Basin uses a larval trigger study to manage their wetland projects. The management strategy for the SJ can be very flexible. Cattails would be planted to minimize erosion.
- How can entrainment be maximized? Once the inlet is opened how long can the gates be left open before the wetland overflows? The wetland will not overflow because the bank is higher than the river. How long does it take to fill the wetland? If you have the capability to keep the inlet open 3-4 weeks you should have a lot of larvae.
- The wetland will be dry overwinter and in the spring the inlet opened. The wetland will fill to the elevation of its secondary channel. If larvae are not swimming (i.e. protolarvae) they will have to drift in to the wetland because there will not be an attraction flow. During the 12-hours it takes to fill the wetland an attraction flow would be necessary. If it only takes 12 hours to fill why wouldn't a screen be placed and personnel available for that short amount of time? There may still be issues with a screen but maybe headworks should be built so a screen can be placed. Mechanically does the wetland have to be filled quickly?
- During peak spawn there is about 1 Razorback Sucker/10m² and 3–10 Flannelmouth Sucker per Razorback. Not many other species are present as larvae in the system at that time. To enter the wetland the larvae would have to swim into the inlet and non-swimming larvae would have to be entrained which would likely only happen during the time when the wetland is being filled. An attraction flow may not be needed as the absence of flow itself is an attraction for larval fish once they can swim.
- Is there an issue with anoxic conditions or a need to fertilize? The wetland will leak and that will help with anoxic conditions as would continual flow into the wetland. Water quality probes could be used that upload through a cell phone. Stewart Lake was supposed to be a passive system but now requires substantial management.
- What is the goal of the project? Is this going to be the way we will recover Razorback or a test of a missing type of habitat in the system? This type of project will not likely recover the species but we will want to know if Razorback larvae can survive and grow in such a habitat. You may be able to replicate the concept at multiple sites along the river. What would this project look like as successful? If we fill it, drain it, and get five Razorback is that successful? There will be a variable amount of fish that can be entrained each year. We need to really think through the questions we have for this project before deciding to build.
- The project will also create a downstream backwater. The other way to consider habitat management and recovery is to build backwaters. An assessment of just creating depressions was conducted and a hole would fill up, not flush at high flows, and it would be difficult to remove nonnative fish.
- The next step is to solicit input from the BC. It may take 2 years to generate the funding levels needed and the operational challenge needs to be solved. For phase I and II regular

management was not considered. One of the successes of Phase II was the engagement with water users who are now available to help management needs, such as sediment removal.

- Larval data needs to be assessed to identify likely number of fish which would be entrained.
- The Program could consider stocking the wetland with larvae to see if they survive. Adult fish could also be stocked to see if they would spawn.

Update on Colorado Pikeminnow stocking subgroup meeting – Davis/Zeigler/Program Office

- Based on a recommendation from BC in February, a subgroup (NMDGF, PO, and NMFWCO) met in March to consider a way to revise the stocking plan so recruitment could be identified and reduce possible negative interactions between stocked and wild fish. A memo outlining the developed plan was sent to the BC in April with details to be presented at this meeting. The request to the BC was to determine whether revision to the stocking plan should be drafted based on the proposal.
- The proposal was to move to alternate stocking once recruitment is consistently documented (a certain number of young of year fish captured at a certain number of sites, in 2 of 3 years, twice). This would allow for three years of a wild cohort to be identified and PIT tagged. Increasing the number of PIT tags in wild fish would increase ability to detect survival should fish be recruiting to adulthood. Alternate year stocking would provide a wild fish cohort to recruit in a system without stocked fish of that same cohort.
- One of the benefits of stocking in alternate years may be compensatory reproduction.
- Is there a risk to not stocking? We are trying to reach recovery as fast as possible and reducing stocking may cause recovery to be delayed. But wild fish are more valuable than stocked fish. Compensatory reproduction may be difficult to demonstrate.
- The Program needs to identify wild from stocked fish.
- Southwestern ARCC can produce fish every other year if desired.
- Southwestern ARCC could produce some number of fish that could be stocked should Pikeminnow fail to reproduce and recruit to the young of year. If Pikeminnow recruit in that year those hatchery fish could be held over and stocked the next year. Age 1+ fish have been stocked in the SJ and recapture data shows they do not persist in system. Using that as a strategy might not be useful. There is evidence that stocking age-1+ fish is not a good return on investment. If you stock older fish you could PIT tag them and possibly prey train them.
- If you have long-lived fish you shouldn't have a gap in reproductively capable adults.
- The Upper Basin has strong year classes that might be due to good environmental conditions so alternate year stocking could risk losing a good year of survival for stocked fish. There is stochasticity in the environment and it is unknown what variables produce high survivorship for stocked fish. When the system was more natural the species could persist years without a recruitment event but is that true now? We are trying to compress recovery into a small time frame. There is a risk of missing good environmental conditions that would result in high survivorship of stocked fish. The Program needs to produce adult fish to take advantage of good environmental years. A good spawning year starts with a good recruitment class of smaller fish. There is no evidence to indicate a connection between environmental factors and high survivorship of stocked fish. In the Upper Basin, good spawning is observed after a high flow year but that is also dependent on duration of warm temperatures and spring storms. We will not know if wild Pikeminnow spawn and recruit to young of year until the

fall of that year. To have a good recruitment year you have to have adult fish and appropriate environmental conditions.

- Clark's (UNM) preliminary analysis shows that survival of small Pikeminnow (which are all presumed to be stocked) is substantially less than that of the Upper Basin. In the Upper Basin survivorship of age 1 fish is ~25% and up to 75% for age 3. In the SJ survivorship is only 20-30% for these age classes. This tells us hatchery fish are not very good at surviving and suggests we need wild fish if we want to recover the species at a faster rate. Or fish could be migrating out of the system to below the waterfall and not able to return.
- In the perfect world, we would sample in the fall and use that data to determine whether or not to stock but this is not practical given current production, stocking, and funding regime.
- The proposal on the table is to wait to implement alternate year stocking until consistent demonstration of wild fish recruitment events. Conceptually this is a good idea. Is there a way to use monitoring to determine whether the "consistent" and "recruitment" benchmarks is leading to a reduction in the adult population due to reduced stocking? The new SOW to sample Pikeminnow in the spring will help assess whether wild fish are surviving overwinter. Benchmarks should be tested if we move to alternate stocking.
- This idea could be drafted into the stocking plan and after the BC sees the next few years of results from small bodied monitoring. Then a decision can be made.

Update on waterfall sampling – McKinsty

- Sampling was conducted this winter and spring from the waterfall to Piute Canyon. PIT tag antenna at waterfall downloaded. In the last three years 875 unique fish detected. The antenna has not been deployed when Pikeminnow are expected to be present.
- There were 63 PIT tags that were unknown. Some could be those tagged during this year's nonnative removal efforts (~200 tags were implanted this spring). These data have not been entered into STReAMS yet. Cathcart's data was recently entered, and resolved many of the previous unknown tags.
- There is evidence of Razorback returning from one year to the next.
- 22% of Razorback captured were untagged. Fin clips were given to ASIR but there may be issues identifying these as SJ produced fish because of the signature overlap with NAPI and with fish produced at Horsethief Ponds which uses Colorado River water.
- A total of 25 Razorback sonic and radio tagged in 2016 and moved above waterfall with 10 stocked ~2 miles upstream and 15 either moved to, or captured, tagged and release at Hogback. In 2017, 91 fish were sonic and radio-tagged with 31 released upstream of the waterfall. 2-weeks post release, 13 of the 31 fish stocked above the waterfall were detected 5-35 miles upstream of waterfall. A second tracking trip, 6 weeks post translocation, detected 9 (29%) but that trip was only conducted from RM 77-0. These 9 were not all the same 13 identified in the first trip. It is difficult to get a unique code from the fish via acoustic signal.
- Submersible ultrasonic receivers (SUR) were placed at the waterfall and big bend area of the SJ arm in Powell Reservoir. At this downstream SUR over 45 individual fish detected; 58% of the fish the fish released upstream of the waterfall were detected in Powell with 7 of those at the waterfall SUR. It is common for a fish to pass a SUR and not be detected.
- A trip was conducted to sample backwaters in SJ arm below waterfall. There were no captures of Razorback but Pikeminnow were captured (~300 fish, 32-200 mm TL). Based on size range these could be wild spawned fish but it is impossible to tell. In one backwater 200

Pikeminnow were captured. The backwater was about 200 m² and four miles downstream of waterfall. Fixed sites have been identified and these will be consistently sampled.

- There are about ~ 34 river miles below the waterfall but reservoir is rising about 5 inches/day. If it was not for the waterfall fish would have an additional 34 miles of connected river.
- Future work includes continuing to use the PIT tag antenna, active and passive tracking, and sampling. McKinstry is in discussion with the PO to deploy a permanent PIT tag antenna.

Update on Lake Powell captures – added agenda items

- In 2011 and 2012 about 75 Razorback/year were captured. Halfway through 2017, captures have totaled 77 fish with two Flannelmouth Sucker. Submersible PIT tag antennas detected 32 unique Razorback and 11 of those have been captured. 40% of fish detected or captured were from the 2013 stocking at Montezuma Creek. One Razorback was from Green River. It had passed up the waterfall during the last inundation, detected in the San Juan in 2014, and then captured below waterfall in 2017. Most 2017 sampling is occurring at Neskahi due to limited accessibility of upstream reaches. Captures of Razorback right now are occurring in deeper water and may be indicative of another spawning event. The largest Razorback captured during this project was this year (a 665 mm, healthy untagged female).

Update on 2017 nonnative removal efforts – added agenda items

- The tagging trip was conducted on 13 March by both agencies. Removal in the upper river began on 20 March with 2 passes per trip (4 boats) from NMFWCO. Eight removal trips were planned but Animas discharge was higher than normal (flows were ~ 3,700 cfs) by trip 5. At that time, 113 Catfish had been caught so the decision was made to postpone the rest of the trips until after spring runoff. They have been rescheduled for August and will be done prior to tagging trip which occurs before fall monitoring. UDWR marked about 800 fish and did not have many recaptures. They moved trips due to personnel. Four more trips will be done in late summer.
- Removal may have started too early, as there were few captures of Catfish during the tagging trip. Water at that time was 9° C.

Outstanding BC business

Update on Grass Carp stockings in the San Juan River Basin – State and Tribal agencies

- A permit is required to import fish to NM and all grass carp have to be notarized and certified as triploid by USFWS before they can be imported. In San Juan County, NMDGF has authorized 22 imports. Any ponds with hydrological connection to the river need to be screened. Two import permits have been approved in 2017 in ponds that did not have a hydrological connection to the river.
- Colorado Parks and Wildlife (CPW) has a complete database of stocking by the agency since 1973 and no Grass Carp have been stocked into the San Juan. CPW does allow stocking of grass carp by private individuals and the applicant has to apply for a permit, vendor has to supply a report, and part of the permit is a requirement for the pond to be screened and fish stocked have to be certified as triploid by USFWS. Those records are not in easily searchable or well organized. CPW does allow stocking of fertile diploid on the East Slope but a regulation is currently proposed to only allow triploids throughout in the entire state. In

northwest Colorado in the Upper Basin, CPW stocked three ponds with triploids in the Grand Junction vicinity in late 1990s and none since then.

- The original request for information on Grass Carp stockings came from the Upper basin by Kevin MacAbee.
- No information on stocking from tribal partners.

Long Range Plan update – Mata

- Annual updates have been received from most PIs and incorporated into current draft's appendix. The BC was supposed to provide comment on that part of the draft. The upcoming CC meeting will be the first discussion with the committee pertaining to the PO's effort to revise the LRP. The desire is to separate appendices from LRP and review and update the LRP about once every 5 years.

Update on revised flow document – Franssen

- The PO has a draft but is waiting for the results from model runs BOR has requested from Colorado. After the first model run with new decision tree, it was determined that the hydrology model needed to be reconfigured to only include current depletions rather than full build out. This is what is causing a delay.
- What does “current depletion” mean? This was the terminology given to PO. Those at NIIP have not been contacted to ask what their depletions are. Has Jim Perry been involved with these model runs? How is tribal trust water being considered? Current conditions is what the modelers were asked to run but the PO does not know what those numbers are or who is making decisions about what and how the water is being measured. It was thought the BOR has been in contact with water users to obtain values.
- BOR's contract with the modelers runs out in June so that would be the latest time in which the PO would get the data. It will not take long to rerun the analysis for the draft document.
- The model runs are going to be used to make comparisons between the old and new decision tree and quantify the likelihood of meeting flow benchmarks with the new decision tree. The Program made the decision to change the decision tree and the analysis should provide us an idea as to how we will be able to meet flow benchmarks.

Discussion of revised Pathways document – Durst

- The revised Pathways document was sent to the BC 2-weeks prior to the meeting. That version incorporated comments from February's meeting discussion including defining recruitment to adulthood of wild fish. The peer reviewers wanted variable detection probabilities and those were developed.
- The goal is to finalize the document with an additional round of BC feedback.
- Written comments on the most recent version were not solicited from peer reviewers but can be, if there is available funding.
- One of the concerns about the trigger was about using adult monitoring data. Is there a way to assess the relationship between Adult Monitoring CPUE data and annual abundance estimates? Is there a need to finish this document before there is a linkage between numbers derived in part two and described in part one?
- The BC should provide their review of the revised Pathways document to the PO by 15 July.

Plan for Razorback Sucker too small to stock (< 300 mm TL) – Davis and Program Office

- The majority of fish under 300 mm come from NAPI. Those ponds get de-watered so holding fish can be difficult. One solution is to stock those fish below the waterfall. Ojo ponds would not be feasible so a pond would have to be built at NAPI. One option is to leave a pond with water each year to hold the small fish over. No decision as to the disposition of these fish has been made. We do not want to confound the work being done in Powell Reservoir by stocking small fish there. Stocking below waterfall is not considered a good option.
- Could stocking of fish < 300 mm TL occur even if it has retained its tag? The number of non-tagged fish has flattened out to 9%. If you want to know for sure, without any doubt, that a fish is wild, you do not stock < 300 mm TL. At last meeting BC voted not to stock < 300.
- What is the issue with humane disposal of fish?
- The number of fish < 300 mm each year is low to as high as ~500. Those are mostly NAPI fish.
- The other hatchery which produces Razorback can hold back small fish.
- USFWS region 2 will determine if the Program can humanely dispose of small fish.

NAPI ponds engineering plans –McKinstry

- There were issues this spring with some NAPI ponds and the engineering plans were not available to understand how the system was plumbed. The Program needs to obtain the plans to know how to fix issues. Keller Bliesner came and fixed the issues this spring.

Proposed changes to Program’s annual reports (annual summaries with more detailed reports 3-5 years or at end of a project) – Program Office

- The PO is considering a change to the annual reporting process, suggesting a more streamlined annual product and project report every 3 to 5 years or when the project is completed. This would help reduce Program costs and remove annual burdens from PIs. The PO could work with the PIs to determine what data are needed in an annual summary. There is no plan or generic framework for what an individual annual summary would look like as the PO wanted to gage the BCs’ reception to the idea. The executive summary provided each year from adult monitoring is helpful and that might serve as a framework. Some PIs expend a lot of effort to analyze data and on the other hand a point could simply be added to a graph.
- PIs in the Upper Basin submit more pared down reports but may not be a good guide. Some of those reports simply state contracted work was done with no further detail. The reports submitted through the Program are extensive and are a lot of work to produce. What is produced for the Program is like a final report submitted in the Upper Basin. The Upper Basin reports can be easily compiled, for example USFWS Region 6 compiles a 17 page report which takes about a week. The Program reports could be paired down and it would make them less onerous than they are now.
- A 10 page limit could provide for communication of a large majority of the information need. The reports would need to have enough detail to communicate annual results and recommendations or it would be useless. It would be helpful for the PO to provide the PIs with an example of format and level of detail. It would be up to the PI to decide what the most important data to communicate are. This seems like a good idea and then in three or so years PIs provide a longer final report. If the desire is for the PIs to answer the entire set of SOW hypothesis then the report will have to be 100 pages. There will be some big differences between projects, so a boilerplate framework might not be helpful. The PO will be touching base with each PI to figure out how to reduce 2018 costs since the AWP is over

budget and that might be a good time to discuss how to best streamline reports with each PI. The peer reviewer's contract only allocates money to SOWs and meetings so the only review of reports the Program will receive will be from BC members, so from a readability and review standpoint it is better to have reduced reporting.

Process through which Utah could become a member of CC and BC – added agenda item

- Utah is considering becoming a Program participant. This is supported by the UDWR Director's office. The Program Document states "If Utah decides to participate by signing the CA [Conservation Agreement], a vote of the Coordination Committee will not be required."
- The original reason why Utah did not sign might have been about surface water rights.
- After Utah signs the CA, they can automatically assign a CC representative and then a vote for the BC nominee will need to be conducted for BC membership.

Upcoming meetings

- A Doodle Poll is needed to schedule a conference call for early July or August prior to CCs approval of the AWP. A fall in person meeting also needs to be scheduled.

Recap decision points and assigned action items

- BIA will determine if selenium study plan can be shared with BC and if so PO will distribute.
- NMDGF will process stocking procedures agreement through its administration.
- BOR and PO will review interim flow guidelines and implement as needed for this year.
- BC will review Monitoring Plan and Protocols and decide if document needs modification.
- BC members will review responses to comments from PIs and if further comment necessary will send that to PO by 30 June.
- PO will request a report from BOR pertaining to USGS gaging stations.
- BC will provide comments on SOW NEW 5 by 31 May. PIs will incorporate comments and or respond to comments by 15 June.
- PO will add a Phase III discussion as an agenda item for next BC meeting.
- ASIR will derive an estimate of how many larvae may be entrained in Phase III wetland.
- BC members will consider what criteria should be developed to consider Phase III a success
- PO, NMDGF, NMFWCO will draft language to revise Pikeminnow stocking plan but no immediate need until fall monitoring results obtained.
- BC will provide comments on LRP appendix by 31 May.
- PO will ask BOR how "current depletions" are being quantified.
- PO will resend Pathways document and BC will provide comments 15 July.
- PO will determine if there is funding to request additional peer review of Pathways.
- NMFWCO will determine disposition of Razorback too small to stock.
- Navajo Nation will obtain NAPI ponds engineering plans and PO will upload to website.
- PO will create a Doodle poll for a summer conference call and fall meeting.
- PO will update website with meeting summaries.
- PO will determine what reports are outstanding.

BIOLOGY COMMITTEE ACTION ITEM LOG						
(Updated 30 May 2017)						
Item No.*	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised Due Date	Date Completed
1	Provide RBS/CPM stocking/capture/recapture data		PIs to PO	Annually before Jan. 1		
2	Provide Preliminary Draft Report Presentations		PI	Annually at Feb. meeting		
3	Review LRP		BC	Annually at fall meeting		
4	Review Peer Review Comments from the February and May meetings		BC	Annually at fall meeting		
5	Provide Draft Reports		PIs to PO	Annually by end of March		
6	Scopes of Work		PIs to PO	Annually by end of March		
7	Provide Final Reports		PIs to PO	Annually by end of June		
8	Annual Data Delivery		PIs to PO	Annually by June 30		
9	T&E Species Data		BC to PO	Annually by Dec. 31		

BIOLOGY COMMITTEE ACTION ITEM LOG						
(Updated 30 May 2017)						
Item No.*	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised Due Date	Date Completed
10	Annually compile T&E data and Program progress into summary to address overall Program recovery goals/objectives for presentation at annual meeting		PO/BC	By Annual Meeting in May		
11	Distribute Consolidated Data and list of annual data collected and available in the Program's database		PO to BC	Annually by Jan. 31		
12	Recapture analysis on PIT tagged fish		Durst	Annually by March		
13	Coordinate CPM stocking closely with Reclamation to avoid negative impact due to high flows/releases		PIs	Annually		
14	Revise RBS Augmentation Goals (based on the outcome of experimental stocking and analysis by Franssen and Durst). What is the appropriate numbers of fish to stock?	5/10/10	NMFWCO/PO	5/2011 – provide update and extend as needed		
15	Pursue Non-native fish stocking procedures	11/5/09	Crockett and Ruhl	2/23/16		
16	Pursue effects study on Hg/pikeminnow with other groups/programs	1/14/10	Program Office lead	ongoing		
17	Include benchmarks for recovery in LRP (amended to also included in Pathways document)	12/5/14	Whitmore	1/5/15	8/2017	

BIOLOGY COMMITTEE ACTION ITEM LOG						
(Updated 30 May 2017)						
Item No.*	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised Due Date	Date Completed
18	Status updates for the LRP	12/2/15	PIs to Whitmore	2/23/16	5/31/16	
19	Make Program peer-reviewed publications available to Program participants	11/29/16	PO (Mata)	02/21/2017	5/16/16	
20	Determine disposition of Razorback <300 mm TL	02/21/17	NMFWCO	5/16/17	8/2017	
21	Draft a plan for Pikeminnow stockings	02/21/17	PO, NMFWCO, and NMDGF	2/21/17	On hold	
22	Determine if BIA selenium study can be shared with BC and share if permission granted	5/16/17	BIA and PO	Summer call		
23	Review and comment on Pathways document	11/29/16	BC	7/15/17		
23	If funds available request review of revised Pathways	5/16/17	PO	7/15/17		
24	Review Monitoring Plan and Protocols and decide if it needs modification	5/16/17	BC	Summer call		
25	Obtain and post NAPI pond engineering on website	5/16/17	Navajo Nation and PO	Summer call		
26	Update website with meeting summaries	5/16/17	PO	Summer call		

BIOLOGY COMMITTEE ACTION ITEM LOG						
(Updated 30 May 2017)						
Item No.*	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised Due Date	Date Completed
27	Conduct second round of SOW review	5/16/17	BC	6/30/17		
28	Comment on SOW New 5	5/16/17	BC and Peer Reviewers	5/31/17		
29	Revise SOW New 5 based on comments	5/16/17	NMDGF and NMFWCO	6/15/17		
30	Review decision making process for Navajo Dam operations	5/16/17	PO and BOR	Summer call		
31	Obtain report from BOR on USGS gages and determine what reports are outstanding	5/16/17	PO	Summer call		
32	Determine what constitutes "current depletions"	5/16/17	PO and BOR	Summer call		
33	Consider what criteria would make Phase III wetland project a "success"	5/16/17	BC	Summer call		
34	Estimate how many larvae could be entrained in a Phase II wetland	5/16/17	ASIR	Summer call		
24	Revise "Pathways" Document	11/29/16	PO	02/21/2017		4/26/17
19	Investigate Upper Basin requests for STReAMS database funding	12/2/15	Whitmore	3/31/16		5/16/17

BIOLOGY COMMITTEE ACTION ITEM LOG						
(Updated 30 May 2017)						
Item No.*	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised Due Date	Date Completed
23	Comment on updated Annual Cycle	11/29/16	BC	02/21/2017	5/16/16	5/16/17

*Items were re-numbered after changes were made

Yellow highlight indicates annual action items

Green highlight indicates new action items

Red highlight indicates completed action items that will be removed from the next iteration of the Action Item Log