



Approved Summary
San Juan River Basin Recovery Implementation Program
Biology Committee Meeting
Public Lands Center
Durango, CO
19-20 February 2015

Attendees:

Biology Committee Members:

Bill Miller, Chair – Southern Ute Indian Tribe
Jacob Mazzone – Jicarilla Apache Nation
Brian Westfall – Bureau of Indian Affairs
Jason Davis – U.S. Fish and Wildlife Service, Region 2
Mark McKinstry – U.S. Bureau of Reclamation
Benjamin Schleicher – U.S. Fish and Wildlife Service, Region 6
Vincent Lamarra – Navajo Nation
Harry Crockett – State of Colorado
Eliza Gilbert – State of New Mexico
U.S. Bureau of Land Management – absent
Tom Wesche – Water Development Interests
Dave Gori – Conservation Interests

Program Office – U.S. Fish and Wildlife Service, Region 2:

Sharon Whitmore
Scott Durst

Peer Reviewers:

Steve Ross – Eco-Consulting Services and University of New Mexico
Mel Warren – Forest Service Southern Research Station
Wayne Hubert – Hubert Fisheries Consulting and University of Wyoming

Interested Parties:

Dan Lamarra – Ecosystem Research Institute
Dale Lyons – The Nature Conservancy
Ben Zimmerman – Southern Ute Indian Tribe
Chris Cheek – Navajo Nation Department of Fish and Wildlife
Nate Cathcart – Kansas State University
John Brant – Kansas State University
Mike Ruhl – New Mexico Department of Game and Fish
Brian Hines – Utah Division of Wildlife Resources, Moab
Nate Franssen – University of New Mexico
Dale Ryden – U.S. Fish and Wildlife Service, Region 6
Tom Sinclair – U.S. Fish and Wildlife Service, Region 2
Bobby Duran – U.S. Fish and Wildlife Service, Region 2
Katie Creighton – Utah Division of Wildlife Resource, Moab

Carrie Lile – Southwestern Water Conservation District
Jamie Shockey – Public Service Company of New Mexico
Howard Brandenburg – American Southwest Ichthyological Researchers
Michael Farrington – American Southwest Ichthyological Researchers
Jen Kennedy – American Southwest Ichthyological Researchers
Steven Platania – American Southwest Ichthyological Researchers
Weston Furr – U.S. Fish and Wildlife Service, Region 2
Mike Greene – Public Service Company of New Mexico
Ernest Teller – U.S. Fish and Wildlife Service, Region 2
Stephani Clark Barkalow – American Southwest Ichthyological Researchers

Approve 3-5 December 2014 draft meeting summary and review Action Item list:

- Durst incorporated previous edits and Gori recently sent additional wording related to the creation of low velocity habitat in the context of the Colorado pikeminnow PVA. Durst will include these changes prior to distributing the approved summary.
- Wesche motioned to accept the meeting summary as approved, Lamarra seconded, and the summary was approved unanimously.

2014 hydrology – Behery:

- There was good soil moisture going into the 2014 water year but subsequent inflows to the reservoir were only 54% of average. Although the decision tree indicated a 1-week spring peak release, after conferring with the BC and Program Office, Reclamation determined that a spring peak should not be released to improve storage conditions in the reservoir.
- Conditions for the 2015 water year have been very dry to date but forecasts are calling for a wetter than average late winter and early spring.
- Based on the environmental flows workshop, the end of year storage target for Navajo Reservoir will be 6,063 feet with the option to draw the reservoir down to 6050 feet and there will be no spring peak release for 2015 to improve storage conditions in the reservoir. If average conditions occur over the next few years, a 1-week and full hydrograph would be released in 2016 and 2017, respectively.
- Perturbation calculations are based on storm events in the previous year. 2013 was not a perturbation year, but 2014 and 2015 are both perturbation years.

Water temperature – Miller:

- USGS began real-time temperature monitoring in March 2014 and Miller collected data until then.
- In 2014 there was no spring peak release from Navajo Dam and little temperature depression occurred in downstream reaches.
- High flow releases from Navajo Dam since 1993 appear to depress temperature as far downstream as Mexican Hat. Pre-dam spring flows of > 5000 cfs resulted in temperatures > 20°C at Mexican Hat on 29% of days but since 1993 only 3% of days with flows > 5000 cfs result in temperatures > 20°C. It appears that high releases from Navajo Dam suppress downstream temperatures in contrast to pre-dam conditions.

Habitat monitoring – Lamarra:

- The use of high definition video resulted in consistent total wetted area compared to previous field mapping efforts.

- Island count and island area increased between 2012 and 2013. The average size of islands increased as a result of a single island complex in the Phase 2 habitat restoration site. Backwater area also increased between 2012 and 2013. Most of the increase occurred in Reach 1 but backwaters decreased in Reach 4.
- The backwater area predicted for 2011-2013 was higher than expected from the 1995-2007 antecedent flow models probably because of the high water year in 2008.
- Flow at mapping seems to be an important consideration in terms of the area of any specific wetted habitat. How is flow at mapping standardized to determine if a habitat is responding to that flow or some antecedent condition?
- Channel change is difficult to assess because under a range of different flows a channel may be wetted or not depending on antecedent conditions.
- Additional information on channel elevation and depth is needed to determine what baseflow levels result in the most backwater habitat. Backwater should be maintained during endangered fish spawning period but increased baseflow will connect secondaries and limit some backwaters. Outstanding questions remain if higher baseflows will lead to more channel incision. Westfall thought data exists to address this question.
- The restored channels that remained wetted at baseflow conditions would have opened naturally under the proper antecedent flow conditions. The mechanical effort speeded up this opening process. The habitat restoration effort has led to a large increase in total wetted area and these sites are wetted at lower flows than they would have if they were not mechanically excavated.

2014 Rare fish stocking summary – Furr:

- 393,442 age-0 Colorado pikeminnow were stocked in November 2014. Soft release sites were at the PNM Sluiceway and Boyd Park on the Animas River. Hard release sites were at Rio del Verde Park in Bloomfield and Berg Park on the Animas River. This stocking total does not include the 453 fish used in the Hogback Weir study.
- A revised razorback sucker stocking protocol was implemented in 2014 to balance stocking source and stocking location. A total of 6,170 razorback sucker were stocked in 2014; 4,155 from NAPI and 2,015 from Ouray (Horsethief Canyon Ponds). Uvalde is no longer being used as a stocking source for razorback sucker. These stocking totals do not include 383 NAPI fish used for the Hogback Weir study.
- Razorback sucker stockings from NAPI and Ouray were split among Berg Park on the Animas River, Bloomfield, PNM Weir, and Montezuma Creek to test for the effects and interaction of stocking source and stocking site. An experiment to test for the effect of hard versus soft releases using NAPI fish was also implemented. A third experiment to test for the effect of the PNM Weir as a barrier to downstream movement was also conducted using NAPI fish.
- NAPI returns were lower than typical, 46.2%, and the total number of razorback sucker stocked was below the annual goal of 11,400 fish. Without stocking razorback sucker from Uvalde, it will likely be difficult to meet the stocking goals even with more normal returns from NAPI and current pond capacity at Ouray. Not meeting the stocking goals was not seen as a serious problem given the expected higher survival rate of NAPI and Ouray fish compared to Uvalde. But the total stocking goal of the current nine year augmentation plan has been achieved.
- Augmentation plans for 2015 will be the same as 2014 apart from some possible experimental stockings further upstream in the Animas River.

NAPI grow-out ponds and PNM Fish Passage – Cheek:

- 9,100 razorback sucker 180-220 mm TL were stocked into the three NAPI ponds from SNARCC in April. There was only a 46.2% return during passive and active harvest; return rates of 60-

65% are more typical. Mean length at harvest was 368 mm TL. The pond with the highest return rate and largest fish varies annually.

- There were undiagnosed fish health problems in 2014. Also there were problems draining East Avocet that led to fish being stranded during harvest. The drained ponds have not fully dried this winter so it has not been possible to re-grade the ponds to allow for better draining in 2015. Cheek suggested leaving East Avocet dry this year so this grading issue could be addressed. The group discussed various options; stocking remaining ponds at higher density may reduce growth, rehabilitating the 6-pack ponds would require significant investment, a new pond could be built if additional capacity is needed, rotational fallowing of the ponds would be useful to ensure appropriate grading and to better manage vegetation. A decision on what to do will need to be sorted out at the next conference call.
- The PNM Fish Passage operated from April to October 2014. A total of 9,014 native fish were captured compared to 131 non-natives. This included 10 razorback sucker and 40 Colorado pikeminnow.
- A PIT tag antenna was installed in the downstream portion of the fish passage to determine efficiency. Also a self-cleaning screen will be installed in April to improve flow conditions within the passage. Native fish appear to move into the passage during hydrologic peaks but there are few captures during monsoon season when the passage does not operate properly (this should be addressed with the self-cleaning screen). There were a total of 636 fish detections at the antenna. Fish were being detected in the passage during monsoon season but they were not captured. Most detections occurred at night. 559 razorback sucker were detected at the antenna but only 3.5% of those detected at the antenna were captured in the passage. 26.9% of detected Colorado pikeminnow were captured in the fish passage. A second antenna will be installed further upstream in the passage to better evaluate passage efficiency.

Larval fish monitoring – Farrington:

- 312 larval Colorado pikeminnow were collected in 2014 compared to a total of 58 in the previous 21 years. Larval razorback sucker remained abundant, 612 were collected in 2014.
- Larval Colorado pikeminnow were distributed throughout the river in 34 different collections. Back-calculated spawn dates were from mid-June to early July. Year was a top covariate for the delta parameter (presence/absence) and adult and sub-adult CPUE from Fall Monitoring were in the top models for the mu parameter (density).
- Larval razorback sucker were distributed throughout the river in 74 unique collections. A juvenile fish was also collected (56 mm TL). The 110 day spawning period observed in 2014 was longest on record for the San Juan River. Top models for delta and mu parameters included the cumulative effect of razorback sucker stocking. Flow parameters also had some support but the effect of flow on larval razorback was negative. Other native suckers were variable but stable over time.
- The mixture models initially presented last year that combined density and presence/absence data were used for all 2014 analyses. These models better describe zero-inflated datasets such as the larval monitoring.
- Larval monitoring at the RERI sites indicates they function like other low velocity habitats in the river.
- The group discussed the pros-cons of using ethanol versus formalin as a preservative. Ethanol allows for otolith and genetics work but identification is easier for specimens stored in formalin. The group discussed the benefits of developing San Juan specific growth rates to back-calculated hatch and spawn dates.

Small-bodied monitoring – Gilbert:

- Small-bodied monitoring has documented a decline in the density of common non-native fish through time but the density of common native species has remained stable. The group discussed possible changes in sampling methodology but sampling has been consistent over time and mesohabitats continue to be sampled in proportion to their availability.
- A random forest analysis that averages regression trees was used to predict fish densities by habitat metrics and other parameters. Although these factors only explained between 12-43% of variation depending on species, in all cases RM and year appeared as the top predictor and a habitat measure was the third most important variable (and was consistently silt for red shiner, mosquitofish, and fathead minnow). A redundancy analysis (functionally a constrained PCA) indicated the non-native fish decline over time correlated with a decrease in silt habitats and fewer summer days when flow < 500 cfs. The increased connection of secondary channels to primary channels at higher summer flows (that has been observed through time) is the current working hypothesis to explain these observed declines in non-native species and silty habitats.
- The presentation to the CC in May will include an overview of Colorado pikeminnow captures, the ability of this monitoring effort to detect wild pikeminnow recruitment when it is occurring, and a summary of monitoring at the RERI sites and sites upstream of the Animas River.

Adult monitoring – Schleicher:

- There has been a general increase in the scaled catch rate of Colorado pikeminnow in the river for at least one overwinter period since 2003. More adults and sub-adults were collected in 2014 compared to recent years.
- The scaled catch rate of razorback sucker in the river for at least one overwinter period has also generally increased through time and has been stable since 2010. However, fish in the recruitment size are not regularly collected.
- The reach of the San Juan River upstream of the Animas River confluence is largely a native fishery. The group discussed if this sampling effort should continue into the future versus additional sampling in the Animas River.
- Endangered fish have become common in Adult Monitoring collections. Catch rates of other commonly collected species except common carp have been variable but stable over time.

Non-native species monitoring and control, upper river – Duran:

- There was no non-native removal effort in the PNM-Hogback reach in 2014. Only 8 channel catfish were collected in this reach during Adult Monitoring in 2014. This removal effort was shifted downstream of Shiprock. It will be interesting to see what happens in the PNM-Hogback reach without non-native removal effort.
- There was little change in the CPUE of non-native species in the Hogback to Shiprock reach in 2014.
- There were four removal trips in the Shiprock to Mexican Hat reach from April to September 2014 plus a tagging trip that occurred in April. Channel catfish exploitation rates after the first removal trip were 7.1% and 13% overall. Juvenile and adult channel catfish populations have been variable but stable over time in this reach.
- Common carp continue to be rare in all reaches.
- More adult Colorado pikeminnow were collected in 2014 and a spawning aggregation around Four Corners Bridge has persisted the last several years. Razorback sucker from multiple age and stocking classes continue to be detected.
- The group discussed potential impacts of non-native fish removal during the spawning period for endangered fish.

- In 2015 new techniques will be implemented including hoop nets, minnow traps, and baiting. Also channel catfish movement will be evaluated to determine if timing or locations could be targeted to improve the effectiveness of the non-native removal program.

Non-native species monitoring and control, lower river – Hines:

- Effort in the lower canyon during summer 2014 shifted upstream to the Montezuma Creek to Mexican Hat reach. In 2014 there was one marking pass and eight removal passes that occurred as late as November.
- Channel catfish Lincoln-Peterson population estimates have remained stable but variable over time. Overall exploitation rates were 11.4%. Channel catfish catch rates appeared higher in the lower canyon because it was not sampled in the summer when catch rates there are typically low.
- Colorado pikeminnow captures appear to have declined over time and razorback sucker numbers remain low in these downstream reaches.
- Because non-native removal in the middle reach from Montezuma Creek to Mexican Hat in the summer appeared to be productive, that effort will continue in 2015. Hines suggested a discussion on ETS electrofishing setting to avoid negative impact to Colorado pikeminnow while still removing channel catfish.

Fish movement and tributary use – Cathcart:

- Cathcart detailed proposed study efforts for the 2015 field season. His work has been funded by Reclamation but has been informative for the Recovery Program.
- McElmo Creek flannelmouth sucker spawning study. Movement and spawning site selection will be addressed with PIT tag antennas. Environmental factors will be evaluated including water quality, predators, and adjacent land use. Larval development in McElmo Creek can also be investigated in addition to the redistribution of large-bodied fish based on recaptures in the San Juan River. Why are razorback sucker not as successful as flannelmouth sucker in McElmo Creek? Razorback sucker may be obligate to big rivers rather than small streams.
- Can larval/juvenile razorback sucker be stocked and imprinted to McElmo Creek?
- Monthly sampling below the waterfall is planned to occur with active methods in addition to PIT tag antennas. Also PIT tag antennas can be deployed to Chaco Wash and the lower Animas River.
- Cathcart will write-up a study plan of these various proposals for BC review and feedback.

PIT tag summary – Durst:

- PIT tag data seemed to indicate an overall decline in Colorado pikeminnow numbers but this was offset by an increased number of adults. The group discussed the decline in Colorado pikeminnow corresponded to stocking outside of the area regularly sampled during raft-mounted electrofishing activities. Has there been an increase in Colorado pikeminnow catch rates in upstream reaches where fish have been stocked in recent years? High standard errors around point estimates make it difficult to determine trends in Colorado pikeminnow abundance.
- Razorback sucker have increased over time in terms of number of PIT tagged fish encountered and abundance estimates but trend appeared to be stable since 2010. Razorback sucker have persisted in the San Juan River multiple years post-stocking. The capture of razorback sucker without PIT tags does not seem to suggest wild recruitment is widespread and these untagged fish are more likely due to PIT tag loss. The Natal Origin study should help to sort this out.
- Because there are multiple estimates for the endangered fishes' populations using CPUE data, abundance estimates, number of individual captures, and number of fish present based on Adult Monitoring data it would be helpful if all of these estimates were presented on a single slide.

Movement, survival, and detection of stocked razorback suckers – Franssen:

- A manuscript is currently being prepared based on the results of this presentation.
- Program MARK was used to evaluate stocked razorback sucker survival and detection. Top ranked models for survival and detection included first-year post-stocking, stocking source, stocking site, and size at stocking. Mortality was highest for the first year in river and there was annual variation in survival but it was not related to seasonal discharge. Fish from NAPI had the highest survival and Uvalde the lowest, survival was highest for fish stocked at Shiprock, and there was a positive effect of size at stocking but it was asymptotic. Detection probability was higher the first year in the river, there was annual variation in detection that was not related to seasonal discharge, detection probability was lowest for fish stocked at Shiprock and highest for fish stocked from SNARCC, and size had a positive effect on detection but was asymptotic.
- Razorback sucker were detected consistently downstream from stocking locations and subsequent movements were balanced between upstream and downstream directions.
- Additional details on this presentation will be available when the draft manuscript is distributed to the group.

Assessing the case for prey limitation: historical and contemporary trophic positions of Colorado pikeminnow in the San Juan River – Franssen:

- The hypothesized historic food web of the San Juan River likely included roundtail chub but this species is largely absent from the San Juan River today. There seems to be limited recruitment of stocked Colorado pikeminnow at a size class when they should be shifting to a piscivorous diet. The fractionation of ^{15}N is smaller than expected for Colorado pikeminnow in size classes that should be primarily piscivorous. But based on limited museum specimens, fractionation of pre-dam Colorado pikeminnow was as expected and larger than contemporary fractionation. A laboratory experiment indicated that Colorado pikeminnow tissue turns over relatively soon following a diet shift. So the low level of fractionation was not due to allowing insufficient time to pass to detect a diet shift.
- Also Colorado pikeminnow ^{15}N was more enriched compared to channel catfish but based on a study by Tim Patton et al. only 8% of channel catfish had fish parts in their stomach. So Colorado pikeminnow are more piscivorous than channel catfish but not as piscivorous as expected.
- Data suggest that Colorado pikeminnow in the San Juan River are not completely piscivorous but it is unclear if this is normal. Perhaps prey densities are lower than they were historically or extirpated fishes (like roundtail chub) may have been historically important prey. It is unclear if this lower trophic position of Colorado pikeminnow limits recruitment in the San Juan River. It would be useful to conduct a similar study in the Upper Colorado River to address some of these questions. It appears that San Juan River Colorado pikeminnow weigh less than those in the Green River when length is held constant suggesting that fish in the San Juan have low condition. But fish in the San Juan may be younger than fish in the Upper Colorado of the same length.

Using microchemistry to determine natal origin in razorback sucker – Clark-Barkalow:

- Preliminary work conducted in 2013 determined that the distal location of the removed fin ray was important for later analysis so a specialized fin ray cutting tool was developed. The microchemistry of the fin ray could be used to correctly classify fish origin but this assignment was not perfect.

- In cases where fin rays could not be properly assigned to origin, elemental analysis of the fin ray could be used in addition to isotopic analysis but isotopic analysis is quicker and easier than elemental analysis.
- Additional results will be presented during the May meeting.

General discussion of 2014 project reports, results, and data; overall assessment of what was accomplished; progress toward recovery; questions to be addressed for annual meeting; additional data integration priorities:

- The Program's priorities were discussed during the December BC meeting. These included by rank:
 1. ESA compliance activities (O&M of existing facilities, SJRB Hydrology Model, peer review)
 2. Augmentation, including production, stocking, and evaluation.
 3. Initiate process for reviewing and revising, if needed, Program flow recommendations including:
 - a. Planning and conducting workshops
 - b. Data integration in association with upcoming revision to flow recommendation
 - c. Integration of general biological data
 - d. Monitoring and evaluation
 4. Connectivity and range expansion
 5. Efforts to document recruitment
 6. Non-native monitoring and control
 7. Fish monitoring (in order of priority: larval, small-bodied, and adult)
 8. Habitat monitoring
- The Peer Reviewers commented on the sophisticated statistical analyses being conducted across the Program but they suggested that more effort needs to be made to standardize statistics among different projects and include variance measures when available. Additionally, presentation of redundant data should be minimized and the Peer Reviewers suggested PIs exercise caution when interpreting non-statistical trends and single data points.
- The group discussed refinements to the Program to achieve recovery goals within a limited timeframe (i.e., 2019 and 2023). What needs to be done to achieve recovery? Some ideas discussed included stocking bigger fish, rehabilitating NAPI ponds, conducting riverwide population estimate to determine how many fish are present (and developing an SOW to carry out this effort – this could be done by the Program Office). Since the populations for both endangered fishes are not self-sustaining is there a need to conduct a population estimate? Any population estimate sampling should be solely dedicated to that effort. The BC should continue discussions of the value of conducting a formal population estimate in 2016 and prioritize SOWs to reflect that if it is determined to be appropriate. The bottlenecks limiting recruitment need to be identified and addressed in order to achieve recovery.
- The group discussed the non-native removal program and how removal seems to have little effect on non-native fish and little measureable benefit to native species. Should the non-native removal program be eliminated or substantially changed? What other management actions could be conducted with these funds? The current non-native removal effort contributes substantially to the capture and tagging of PIT tagged fish. The impact of non-native fish on native fish is not well understood. Maybe non-native removal effort needs to be substantially increased to have a measureable effect on non-native species? Non-native fish are included as a threat in the listing criteria for the endangered species so the Service may have some difficulty abandoning this effort. The group needs to consider management that could occur in place of non-native removal or

actions that could increase the effectiveness of non-native removal. There is also concern that timing of non-native removal efforts overlaps with endangered fish spawning.

- Any substantial changes to the non-native removal program will need to be backed-up with written documentation to the Service justifying those changes. All the options about how to change non-native removal need to be thoroughly examined and discussed. The BC was unanimous in their recommendation to investigate substantial changes to the non-native fish removal program. The Program Office will develop a position paper summarizing the effects of the non-native removal program to date. PIs should develop possible alternative management actions to the current nonnative removal program by the May meeting when the 2016 draft Annual Work Plan will be reviewed.
- ASIR suggested switching to formalin as a preservative for larval collections. The group discussed the benefits of a San Juan specific back-calculated spawning and hatching date. It would take a specific SOW in order to accomplish this. For the coming year, ASIR will continue to use ethanol as a preservative for larval fish collections in 2015 (i.e., no change from 2014 protocol).
- The group discussed the potential lack of appropriate prey for Colorado pikeminnow. Could the lack of roundtail chub in the San Juan River limit recruitment for Colorado pikeminnow?
- The Program Office needs to clarify the Service's position on recovery actions conducted outside of critical habitat, specifically stocking outside critical habitat.
- Any changes to baseflows in 2015 should be deferred until the broader discussion on evaluating flow as part of the flow recommendation revision process.
- Is there a need for additional capacity at the NAPI Ponds? If there was an additional pond, current capacity could be maintained while leaving one pond fallow for various management activities (e.g., re-grading and vegetation control). Also an additional pond could allow for lower stocking density with all ponds in production and possibly higher growth that could benefit post-stocking survival rates (i.e., fish stocked at larger sizes have higher survival rates). Once 5,800 razorback sucker are present in the San Juan River, should stocking occur at a pace to replace mortality until recruitment is documented? Do the augmentation plans for the endangered fish need to be updated?

Evaluation of opportunities for irrigation system improvements and water markets to support San Juan River Basin environmental flows – Lyons:

- Lyons presented results of a study to increase agricultural efficiency and reduce agricultural water usage in order to benefit environmental flows in the San Juan River.
- A literature review explored water savings that could be accomplished through off-farm efficiency, on-farm efficiency, and the development of water markets. Lyons detailed examples in the Verde River, AZ, Government Highline Canal, CO, and Deschutes River Basin, OR where irrigation system improvements increased downstream flows and reduced diversions. Interviews with New Mexico ditch organizations revealed these facilities are typically manually controlled, many ditches would benefit from piping or lining, inefficiencies in how the City of Bloomfield obtains water from the Bloomfield Irrigation District, development limits some users from utilizing their water, and these organizations support coordinated efforts to improve irrigation systems within the basin.
- The group discussed the New Mexico Attorney General's opinion that instream flow can be a beneficial use of water. Additional agreements would be needed to allow water to remain instream for beneficial use. Water rights could possibly be bought or leased to benefit environmental flows. Since return flow from leaky ditches gets back to the San Juan River, improved efficiency may have unintended consequences on flows in the San Juan River. Also

improved on-farm efficiency may result in greater production and no change in net water use. There could be substantial water savings by lining ditches and installing pipes instead of using open canals on the Navajo Nation. Could the Program reach out to irrigators to benefit environmental flow and reduce entrainment? If less water was diverted in the San Juan River, more could be stored in Navajo Reservoir for future spring peak releases.

Historical San Juan habitat analysis – Bassett:

- Bassett presented habitat changes in the San Juan River based on the analysis of aerial imagery from the 1930s, 1970s, and 2011. He quantified changes in channel area, island count and area, and bank vegetation. Channel area has declined dramatically through time, island count and area have declined to some degree, and bank vegetation cover has greatly increased.
- This analysis can be used to guide future restoration and identify factors related to sustained channel complexity. Also observed streamflows could be compared to quantified habitat changes. Flow conditions when the images were collected has not been standardized or addressed in this analysis but images from the 1970s and 2011 were taken at low flow but flow during the 1930s images is unknown.
- An interactive map of these results can be viewed at: <http://nmconservation.org/sanjuan/historicalhabitat/>

Opportunistic razorback sucker stocking in the Animas River – Cheek:

- Cheek distributed a memo proposing stocking a limited number of razorback sucker in the Animas River downstream of Durango. There are entrainment issues in some portions of the Animas River and stocking would not occur directly upstream of these locations. It would be possible to stock fish on Southern Ute Lands but the Program would need to formally request this in writing. There are suitable stocking sites as far upstream as Durango. Southern Utes monitor the Animas River in even numbered years and that effort could be used to determine the outcome of any stockings. Maybe remote antennas could be used for additional monitoring?
- The group discussed possible issues with temperature in the Animas River. Entrainment issues will be evaluated in the yet-to-be-funded RFP. Range expansion will be important to increase the distance of drifting larvae. Fish health and importation permits will be easily addressed.
- The group discussed ESA implications of stocking further upstream in the Animas River. Would stocking in the Animas affect any existing or future water development within the Basin? The group agreed that it makes sense biologically to stock further upstream but the ESA concerns need to be addressed. Miller motioned that the Program Office look into the ESA and environmental compliance issues related to stocking razorback sucker in the Animas River. Mazzone seconded and this task will be added to the action item list.

Discussion of timing non-native removal trips during possible Colorado pikeminnow spawning (electrofishing concern) – Miller:

- Miller suggested electrofishing crews avoid sampling during endangered fish spawning periods. Currently crews stop shocking near known spawning bars.
- Non-native removal crews should distribute schedules to the BC and this topic can be further discussed during the March conference call. Are there options to reschedule trips? Do trips need to be shifted?

BIA selenium analysis – Westfall:

- Westfall asked if muscle plug samples for selenium can be collected during Fall Monitoring. Sample preservation can be an issue during long trips. This discussion can be continued during

the March conference call. BIA is primarily interested in conducting selenium analysis but McKinstry is also interested in mercury analysis.

Schedule upcoming meetings:

- Conference call: 25 March 2015 from 1-4pm to cover the remainder of February agenda.
- Conference call: 20 April 2015 from 9am-12pm to discuss flow option based on the latest Reclamation forecast.
- SJRIP Annual Meeting in Durango. BC meeting 12 May 2015, Annual Meeting 13 May 2015, and CC meeting 14 May 2015.
- Conference call: 8 July 2015 from 9am-12pm to discuss any follow-up from the May meetings.
- Conference call: 26 August 2015 from 9am-12pm to discuss any outstanding issues with the 2016 SOWs.
- Meeting in Durango or Farmington 1-2 December 2015 to discuss LRP and Program priorities.

BIOLOGY COMMITTEE ACTION ITEM LOG

(Updated 3 March 2015)

Item No. *	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised Date	Date Completed
1	Provide RBS/CPM stocking/capture/recapture data		P.I.'s to the Program Office	Annually before Jan. 1		
2	Provide Preliminary Draft Report Presentations		Project Leads (authors)	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		Project Leads (authors) to Program Office	Annually by end of March		
6	Scopes of Work		Project Leads to Program Office	Annually by end of March		
7	Provide Final Reports		Project Leads (authors) to Program Office	Annually by end of June		
8	Annual Data Delivery		PIs to Program Office	Annually by June 30		
9	T&E Species Data		BC to Program Office	Annually by Dec. 31		

BIOLOGY COMMITTEE ACTION ITEM LOG

(Updated 3 March 2015)

Item No. *	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised 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		Program Office/BC	By Annual Meeting in May		
11	Distribute Consolidated Data and list of annual data collected and available in the Program's database		Program Office 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		Project Leads	Annually		
14	Waterfall Inundation Whitepaper – review past meeting summaries, determine what is needed, and provide report at the next meeting.	05/18/07	Program Office	12/07/07	Not a current priority	
15	Revise RBS Augmentation Goals (based on the outcome of experimental stocking and analysis by Franssen and Durst)	5/10/10	FWS Fisheries/Program Office	5/2011 – provide update and extend as needed	2/20/15	
16	Develop a detailed outline for San Juan River Recovery Program case history manuscript	11-5-08	Propst/Miller			On hold
17	Pursue Non-native fish stocking procedures	11/5/09	Crockett and Gilbert	12/1/09	2/20/15	

BIOLOGY COMMITTEE ACTION ITEM LOG

(Updated 3 March 2015)

Item No. *	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised Date	Date Completed
18	Pursue effects study on Hg/pikeminnow with other groups/programs	1/14/10	Program Office lead	ongoing		
19	Discussion of what is the appropriate number of fish to stock	3/23/10	BC	ongoing		
20	Schedule maintenance work at PNM	8/5/14	BR, NN, PO	12/31/14	2/20/15	
21	Plan workshops to determine an end of season reservoir elevation for revised available water calculation and develop a protocol to implement replacement for "decision tree" to make releases from Navajo Dam	9/15/14	Program Office	ongoing		
22	Follow up with CC regarding memo on feasibility study to remove barriers in the lower Animas River	12/5/14	PO	2/20/15		
23	Include benchmarks for recovery in LRP	12/5/14	Whitmore	1/5/15		
24	Review SNARCC genetic integrity management plan	12/5/14	BC	2/20/15		
25	Review University of New Mexico genetics assessment	12/5/14	BC	2/20/15		
26	Provide status updates to LRP tasks	12/5/14	Pls to Whitmore	12/31/14		
27	Review and comment on LRP	12/5/14	BC	1/15/15		

BIOLOGY COMMITTEE ACTION ITEM LOG

(Updated 3 March 2015)

Item No. *	Action Item	Meeting/O rigination Date	Responsible Party(s)	Due Date	Revised Date	Date Completed
28	Prepare memo on opportunistic stocking of RBS in Animas River	12/5/14	Cheek et al. to BC	2/11/15		2/12/15
29	Prepare memo on stocking larger RBS from NAPI	12/5/14	Cheek et al. to BC	2/11/15		
30	Review and comment on Population Model report	12/5/14	BC to Miller and Lamarra	1/15/15		
31	SOW to conduct population estimates for Colorado pikeminnow and razorback sucker	2/20/15	PO	5/12/15		
32	Position paper summarizing the effects of the non-native fish removal program	2/20/15	PO	5/12/15		
33	Possible alternatives to current non-native removal program	2/20/15	PIs	5/12/15		
34	Clarify ESA and environmental compliance issues related to stocking razorback sucker in the Animas River	2/20/15	Campbell	3/25/15		
35	Written proposal to BC for feedback on McElmo Creek spawning study, fish sampling below waterfall, and remote PIT tag antennas	2/20/15	Cathcart	3/25/15		
36	Distribute non-native fish trip dates to BC to discuss avoiding electrofishing during endangered fish spawning	2/20/15	Duran and Hines	3/25/15		

* 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

Date	Annual Tasks	PO	CC	BC	P.I.
Oct.	Reclamation administers contracts	X			
Nov.	BC Meeting (peer reviews typically do not attend this meeting) <ul style="list-style-type: none"> Review data integration results from previous year Identify questions for annual data integration Discuss Program priorities LRP review and provide recommendations (with pros and cons) to PO Appoint new BC Chair (every two years) 	X		X	
Dec. 31	RBS/CPM stocking/capture/recapture data to Program Office				X
January	Notification/update of Program rosters/mailling lists	X			
January	Executive meeting (Program Office; Reclamation Fund Manager; CC and BC Chairs) to do preliminary planning for upcoming year	X	X	X	
January	Updated LRP to BC and CC for review	X	X		
January	Reclamation provides a determination of perturbation for BC Review.	X			
Jan. 31	Distribute consolidated PIT tag data and post other data	X			
February	BC Meeting (peer reviewers are expected to attend this meeting) <ul style="list-style-type: none"> Prepare for Annual Meeting Provide preliminary results; draft report presentations Final review of updated LRP Review annual data integration priorities 	X		X	X
Feb/Mar	Final updated LRP to CC (with explanation of input included/not included)	X			
March	CC approval of LRP				
March	Annual guidance/solicitation for SOWs based on LRP/list of prioritized projects	X			
March 31	Draft final reports and SOWs due to Program Office			X	X
April	Preliminary draft Annual Workplan and Budget	X			
May	Annual Meeting <ul style="list-style-type: none"> Program overview P.I. presentations Review preliminary draft AWP Committee reports 	X	X	X	X
May	Annual hydrology meeting to review and solicit information regarding the San Juan River Basin Hydrology Model	X			
June/July	Draft Annual Workplan and Budget	X			
June 30	Provide final reports and data sets to Program Office				X
July	Final reports posted on website	X			
August	Tech review of draft AWP; recommendations with pros and cons to Program Office			X	
August	Revise AWP based on input and transmit final draft to CC with documentation of all input	X			
Sept.	Review and approve final AWP		X		
Sept.	Post final AWP to website	X			