

Biology Committee Meeting Summary
October 3, 2006, Grand Junction, Colorado

Biology Committee: Tom Chart, Tom Pitts, Gary Burton, Melissa Trammell, Kevin Gelwicks, Krissy Wilson, Dave Speas, John Hawkins and Bill Davis (via phone for the first part of the meeting). Colorado was not represented.

Other participants: Dave Irving, Pat Nelson, Tim Modde, Tom Czaplá, Chuck McAda, Angela Kantola, George Smith, Trina Hedrick, Mike Montagne, Sam Finney, Mark Fuller, Kevin Bestgen, Rich Valdez, Leisa Monroe (UDWR), Ann Widmer (SWCA), Craig Walker (UDWR), Wayne Prokopetz (NPS), Kirby Wynn (USGS), Cory Williams, (USGS), Paul von Guerard (USGS), Ray Tenney, and Doug Osmundson.

Assignments are indicated by “>” and at the end of the document.

CONVENE: 8:00 a.m.

1. Review/modify agenda - The agenda was modified as it appears below.
2. Approve [July 18, 2006 meeting summary](#) – The summary was approved as written.
3. Review assignments from July 18 meeting - The Committee reviewed assignments from previous meetings (as were listed in the meeting agenda). Assignments still pending can be found in the assignment list in Attachment 1.
4. Briefing on Utah 3-Species Plan – Trina Hedrick outlined areas of potential cooperation between the Recovery Program and the Conservation and Management Plan for Three Fish Species in Utah (roundtail chub, bluehead sucker, flannelmouth sucker). It’s been easy for Utah to identify 3-species projects for implementation in smaller streams, but more difficult where the three species overlap with the Recovery Program. Utah believes the two programs can cooperate: 1) by eliminating redundant sampling (and thus minimizing impacts); 2) in maintaining connections between the mainstem river and the tributaries; 3) in data sharing; and 4) in managing nonnative species (primarily white sucker) which pose a threat both to the endangered species and the three species. At this point, Utah would like to ask the Recovery Program to think about ways this cooperation can occur. As an example, white sucker are not currently being removed from the river, but evaluation of hybridization of this species with razorback sucker is included in the RIPRAP (as is implementing actions to reduce hybridization, if necessary). Leisa Monroe presented information on white sucker captured during northern pike and smallmouth bass removal efforts and during sampling for the Colorado pikeminnow population estimate. Even with a small and incomplete data set (not all white sucker were enumerated or measured), they are seeing a wide distribution ranging from juveniles to adults. Since white sucker pose a hybridization and resource competition threat to razorback, bluehead, and flannelmouth suckers, Utah believes both programs could benefit by implementing white sucker removal. This could be accomplished by having

two people on the electrofishing boats netting – one person targeting smallmouth bass and the other targeting white sucker or by adding a separate pass down to target white sucker, incorporating a white sucker removal project into our field season with funding coming from the three species program (with the 3-species program funding the second netter and/or additional pass). The Committee discussed widespread evidence of white sucker hybridization in Colorado, Utah and Wyoming. (With regard to increasing numbers and species of nonnative fish, Chuck McAda noted that they captured 10-15 gizzard shad in the Gunnison and Colorado rivers this year, and that they have been reported from the lower Colorado River. Trina said Utah is also seeing gizzard shad in the Green River.) Trina noted that most of the razorback sucker they currently catch are stocked fish and haven't seen many recruits yet, but they would like to remove white sucker now to reduce the potential for future hybridization. >Utah will work with Pat Nelson to submit/revise scopes of work. Utah may also work with local water districts on this. Kevin Gelwicks encouraged somehow evaluating effectiveness of any white sucker removal, assuming that can be done without compromising the effectiveness of smallmouth bass removal.

5. Green River Study Plan – Rich Valdez presented the draft Study Plan for Implementation and Evaluation of Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam (mailed to Committee members on 9/29/06). (See summary in Attachment 2). Gary Burton pointed out that the recommendations in the study plan only address the 18 hypotheses identified as high priority and doesn't address medium and low priority hypotheses. Rich Valdez added that the recommendations in the plan only address the Flaming Gorge flow and temperature recommendations and do not reflect overall recovery priorities. Tom Pitts suggested that the Biology and Water Acquisition committees submit written comments on the plan and then have a joint 1-day meeting with the Green River Study Plan Ad Hoc Committee to discuss it. >Comments on the draft plan are due from the Biology and Water Acquisition committees on November 3rd and should be submitted to the Green River Study Plan Ad Hoc Committee, Biology and Water Acquisition committees (see e-mail ready list under assignments). >George Smith will forward the draft plan to the Water Acquisition Committee. Principal investigators of projects referenced in the draft plan also need to review it and submit comments by November 3rd (PI's are asked to particularly review how their projects do or don't address the uncertainties and hypotheses in the study plan to identify any studies which may have been missed in the plan). >Program Coordinators will contact PI's with this request. The Biology and Water Acquisition committees will meet with the Green River Study Plan Ad Hoc Committee in Grand Junction from 8 a.m. to 4 p.m. on Tuesday, November 28 to review and hopefully, approve the draft study plan.
6. 2007 Green River floodplain inundation studies – Dave Speas suggested the Committee consider what can be done this fall and next spring to follow up on fish which should currently be in the inundated floodplains (which may require revising some FY 07 scopes of work). Rich noted that with regard to the second recommendation on floodplain inundation in the draft Green River Study Plan, it would be good to get crews out at least informally to evaluate survival. Tim Modde emphasized need to determine how to keep

water in these sites. Mike Montagne said Ouray NFH has ~10,000 razorback sucker (excess to stocking plan requirements) that they need to move out by the end of October. If these fish are put in floodplains (perhaps L3 and L4 at Ouray NWR), they should be marked to identify them as hatchery-raised fish. Pat Nelson said we still don't know what portion of fish leave the floodplain in year 3 (and thus, whether we need to hold water in the floodplains over a third winter). Even though we can't rely on having consistent conditions needed to test this, Pat recommends planning to regularly place excess fish in floodplain habitats (recognizing that some years we'll have conditions conducive to survival, and other years we won't). Tim recommended developing a floodplain operational plan identifying scenarios under which we'll reset floodplains, stock fish, etc. By October 11, Pat Nelson will prepare a draft recommendation for placing the excess fish in a floodplain this fall for the Committee's consideration. >Utah will do some pre-sampling in floodplains (Stirrup, Baeser, Above Brennan, and Johnson). >The Committee will discuss this on a conference call on October 16 at 10 a.m. (>the Program Director's s office will send out information for the call).

7. Update on [research framework](#) – Kevin Bestgen distributed a description of this project with a status update. Phase I is looking at how well management actions identified in the RIPRAP address threats to the fish. The conceptual life history models are essentially complete. Ann Widmer gave a brief demonstration of the Access relational database she's developed. It currently contains 125 reports from the last 10 years and allows, for example, queries to identify all reports that addressed a specific life stage and specific abiotic/biotic factors. The Committee discussed the database and its potential for much broader application. Tom Czaplá said this database will be updated annually and will provide us with the ability to track projects and identify information gaps. Rich said Phase I is still underway (with a report expected by early January), but they would like to proceed with phase II at this point (the boundaries between the two phases have turned out to be somewhat blurred). The Committee endorsed initiation of Phase II. >The PI's will update the SOW with current due dates, etc. and provide that to the Committee. Dave Speas suggested that the research framework may help with the synthesis called for in the Green River Study Plan. Tom Czaplá added that it will be helpful with recovery goal revision and the 5-year status review, also. At some point, this database should be put on the web and reports linked to pdf files (and perhaps even eventually to data).
8. Humpback chub issue paper – Tom Czaplá said that the Biology Committee asked for a contingency plan for bringing some of the dwindling numbers of Yampa River humpback chub into captivity, but he and others soon realized we first needed to identify all the issues (see issue paper provided to Biology Committee on 9/19/06). Tom said USGS has the second revision of the Douglas' report on humpback genetics in hand and it does appear that the Yampa population is somewhat different than the Deso/Gray population (Deso/Gray being somewhat more mixed), so it would seem prudent to bring some of the Yampa River humpback into captivity. Tom recommended a research project that would place fish at both the Ouray and Mumma hatcheries (Tom recommends 100 fish at each facility) to allow us to determine how well we can transport fish and get them to survive at these facilities. Tom said the Park Service has suggested an EA will be required, but he believes a research project would be categorically excluded. Tom said he and the

hatchery folks have been working on preparatory health reviews, permits, etc. To bring fish into captivity this year, will need to act before mid-November. We also have to determine the final disposition of the fish. Tom recommends if they are not used for broodstock, they be put back in the wild. Krissy Wilson said that to bring fish back to Colorado from Utah, 60 fish would have to be sacrificed for disease testing. Melissa said NPS is strongly recommending an EA, so it may not be possible to bring in fish this year. Parks concerns are: 1) the effects on the founder population; 2) cumulative effects of taking humpbacks from various populations (including the Grand Canyon); and 3) consideration of what ultimately happens to the fish (will threats have been adequately addressed before they are reintroduced, for example). Wayne Prokopetz from Dinosaur National Monument said decisions regarding NEPA compliance level are made at the park level. The Park believes an EA is needed in light of all the unanswered questions (ultimate disposal, ability to rear, etc.). If this is a research question, however, that would be different. Wayne asked how the number of fish removed for research would compare to numbers of fish lost during usual studies, etc., and he recommended a conference call to discuss these issues. Melissa distributed a rough analysis of the effect of removing 200 juvenile chub (assuming 5-20 would be humpbacks), which shows that it is not likely to have a significant effect on the adult population (in fact, their chances of reaching adulthood would likely be greater in captivity than in the wild). John Hawkins suggested that the actual ratio of roundtail to humpback chub is more likely thousands to one in the Yampa, so he believes we'll be lucky to have any humpback in a sample of 200 juvenile *Gila*. Tom Czaplá said we might be able to capture more humpbacks by focusing on areas where juvenile humpback have been collected historically and looking for characteristics that suggest humpback). Mike Montagne said he thinks that the most difficult thing for the hatchery will be keeping the fish alive and well for the first two weeks after they're brought into captivity. Once they've made it through the first month, he believes humpback will be fairly easy to raise. Tom Pitts asked if there's any way to get around an EA, since that's a very ponderous way to address this. Rich Valdez suggested that if we're below some minimum viable population size for the Yampa population, it might make sense to take some adults into captivity. Craig Walker agreed and suggested that keeping these fish may provide a good opportunity to test propagation methods. Tom Czaplá said we clearly won't be able to bring humpback into captivity this year if an EA is required. Mark Fuller expressed concern that flows may not be adequate for capturing fish this fall. It doesn't appear that Ouray NFH could complete fish health requirements in time to take fish in this year (even if we request an emergency meeting and were granted a variance), but perhaps fish could be taken to Mumma. If the question is whether we can successfully take juveniles from the wild and raise them to adulthood in captivity, the Park Service would probably be willing to view this as research and it would get a categorical exclusion rather than require an EA. The Biology Committee needs to know CDOW's response to this plan. >Tom Czaplá will continue to work on this and will work with the Service and the Park Service to develop a research proposal.

9. Sediment monitoring update – George Smith introduced Cory Williams, Kirby Wynn and Paul von Guerard of USGS. Cory introduced USGS' sediment monitoring and SWMS (surface water modeling system) work and said their report will be completed in 2008.

The components of their work are a retrospective assessment, data collection (at Jensen on the Green River and at Whitewater on the Gunnison River), final report, and the add-on SWMS demonstration project. They are working to characterize relationships between sediment and flow, their role in forming backwater habitats and spawning bars, and aid in evaluation of the Aspinall and Flaming Gorge flow recommendations. Cory discussed the relationship between flow and sediment concentration and sediment transport equations (the correlation breaks down during monsoon events). On the Colorado River, sediment concentrations are actually higher in the summer monsoonal events than spring peak flows, and the total sediment load is of similar magnitude. On the Green River, sediment concentrations are similar in summer monsoonal events to spring peak flows, but total load is less in the summer monsoonal events. SWMS, the multi-dimensional surface-water modeling system has applications for streamflow modeling (characterizing hydraulics in terms of depths, velocities, sheer stress, direction, etc.), sediment-mobility modeling (energy needed to transport cobbles, for example), and habitat modeling (providing velocities, depths, etc. which can be tied into other models). The demo project on the Green River near Jensen includes three-dimensional rendering of the river channel (topology dataset). They calibrated the dataset with 5 hydraulic models (flow levels), discharge conservation, water-surface elevation comparison, and velocity comparisons (at one flow) and got good model calibration. They will provide sediment-mobility maps for calibrated models which can aid in determining flow recommendations. Possible applications include habitat modeling (quantification of habitat at ranges of streamflow) and channel evolution/time-steps (backwater habitat maintenance/creation/evolution) as well as monsoon sediment flushing. MD-SWMS ties into current sediment monitoring in that it can help understand timing/characterization of sediments. This would be portable to the Ouray, Utah area. Data needs are streamflow, water-surface elevation, topology, and sediment information. Melissa asked if this can help us understand how much backwater habitat is created and maintained over large river reaches (e.g., 200 miles). Cory said the data needs would increase. A large amount of data can be collected in a short period of time, and this will only improve as the technology improves. The demonstration project is costing ~\$90K (~\$50K was donated time). George Smith said >Program staff will discuss how Mike Carpenter's time-series monitoring of sediment deposition and erosion at the Jensen Bar can be tied into this SWMS work.

10. Review/discussion of responses to comments by Miller/Musser on their 15-Mile reach report (available at http://www.crwcd.org/page_5) – Ray Tenney said the District reviewed all the comments received and responded as to how they would address those. The District would like to know what they need to do to revise this report for Committee approval. Tom Pitts said he'd like the Committee to let the District know today if their responses are adequate and if not, why. Tom Chart said he reviewed the responses, noting he appreciates the time the authors put into the response (as well as the time the reviewers had put into their original comments). Tom said that the authors' several responses that they simply disagree with many of Osmundson's comments don't seem to him to be an adequate response. Melissa agreed, and pointed out specific comments (from Osmundson and O'Brien) and responses where she thought this was the case. For example, why do the authors disagree with specific comments made about the sampling

design? Tom Chart said that based on portions the authors have agreed to change; he believes a major revision would be required to the report. Ray agreed this will likely be a significant effort. Ray noted that the authors do disagree with some of the reviewers regarding the validity of the report's conclusions. Tom Chart suggested that conclusions should be re-characterized to take the variability of the results into account. Tom said he also has concerns about the application of these results, how representative the report is beyond the area sampled, etc. Melissa questioned the need for the Program to approve the report. Tom Chart, Melissa Trammell, and John Hawkins said they won't really be able to judge how the authors address comments until they see a revised report. Tom Chart emphasized the importance that the conclusions be well supported by the data. Tom suggested that manuscript(s) submitted for publication might be more succinct document(s) for the Committee to review. Tom Pitts expressed concern that there seems to be an underlying fear that this report will somehow undermine the peak flow recommendations. Ray Tenney admitted that if the River District had a choice between contributing 3,000 af to the peak or using 3,000 af to clean off monsoonal mud in August, they'd choose August (this doesn't mean they believe we can take the whole peak flow away, however). Doug Osmundson commented that the size of the report makes it difficult for the Committee to review, and the long timeframe over which the report has been written and reviewed and comments submitted and addressed has also contributed to the Committee's difficulty. The Committee agreed that if the District chooses to revise the report, it needs to go back through peer-review. George Smith asked if there's any way to short cut an extensive review process and perhaps just have the Committee approve an executive summary with recommendations (putting the rest of the report into an appendix). Kevin Gelwicks agreed that a pared-down report would help considerably. Gary Burton asked if it would be appropriate to ask the authors to discuss comments with the reviewers then come back to the Committee with any issues they're unable to resolve. Assuming the District wants to continue to pursue Program approval, they will revise the report, send it back out for peer review (to Wesche, O'Brien, Pitlick, and Osmundson with comments due to the District and the Biology Committee in 30 days) and to the Biology Committee (with comments due back in 45 days).

11. Update on draft evaluation of stocked fish stocking/recapture summary – Tom Czaplá said Travis has begun incorporating 2005 information (razorback data has been entered, bonytail data are not yet complete). Chuck McAda distributed two sets of tables of 2005 captures of all stocked razorbacks (538 razorback were captured in 2005 in the Colorado and Gunnison rivers and 211 were captured in the Green River [note: there was no pikeminnow sampling in Green R. in 2005 to contribute to razorback captures]). Tim Modde said he believes this information is very important and suggested that the Committee do whatever is needed to make it a priority to incorporate the 2006 data and provide a complete report. (Clearly, it appears we're not meeting the survival rates we expected, for example.) The Committee discussed this at the last meeting, and recommended that the analysis be done as soon as possible. Chuck said we have the multiple-pass mark-recapture data on the Colorado River to do more analysis now with an opportunity to do the same on the Green River in the future. >The Program Director's office will continue to pursue this and get a scope of work developed (>PI's for all projects where bonytail and razorback are encountered will need to submit their data with

their annual reports).

12. Update on ad hoc group work to develop a white paper on options for changes to bonytail stocking plan – Tom Czapla said the ad hoc group is waiting for incorporation of 2005 bonytail data into the data set.
13. Update on Implementation Committee discussions of nonnative fish management activities - Angela Kantola outlined the Implementation Committee's discussions and their anticipated direction to the Biology Committee for the upcoming nonnative fish workshop. The Biology Committee tentatively scheduled the workshop for December 11 – 13. >The Program Director's office will talk with Tom Blickensderfer and Tom Nesler to confirm these dates and will work with an ad hoc committee to set up, organize, and facilitate the workshop. The Committee suggested an ad hoc committee to organize workshop consisting of Pat Nelson, Tom Nesler (or his designee), John Hawkins, Melissa Trammell, Dave Speas, Kevin Gelwicks, and someone from Utah.
14. Discussion of draft removal criteria for Yampa River northern pike and smallmouth bass – Tom Chart said the three changes suggested by the Committee were made. Melissa sent out an e-mail suggesting we clarify what reach we're referring to on the Yampa River for northern pike (the Committee agreed). Tom Chart said the criteria call for determining native fish response in Yampa Canyon; the Committee agreed to add criteria for Yampa Canyon (based on historical data). The Committee agreed we need to add a citation to the 20-30% native species composition reference in item #1 under smallmouth bass. John Hawkins suggested a paragraph at the beginning of each criterion to provide context. Tom Chart agreed to add that. These will remain interim criteria. Pat Nelson said he thinks we also need to develop criteria for the Green and Colorado rivers over the next year. >Tom Chart will revise these interim criteria with the foregoing revisions and send it to the Biology Committee; if there are no issues raised within 2 weeks, it will be considered approved for the next year.
15. Recommendations on sampling/handling protocol – John Hawkins said they provided standard operating procedures for pikeminnow last year (and we probably need to do so for other species, also). He's continuing to update the protocol, one purpose of which is to decrease mortalities, injuries and stress to fish. >By mid-October John Hawkins and Tom Czapla will survey PI's for any new information and to see if they have any training needs.
16. Update on progress to [standardize electrofishing fleet](#) – Tom Czapla said that Pat Martinez and Larry Kolz will resume their work this month.
17. Update on information needs to determine if reservoir operations provide opportunity for nonnative fish escapement - George Smith distributed an updated spreadsheet and referenced the draft letter he's prepared to reservoir operators (which he would send to the operators about every 6 months). George Smith said CDOW has hired Ellen Hamann to work on this. Tom Pitts said there's an MOA requiring reservoir operators to give notification any time they'll have a major sediment release, which may be helpful in this.

18. Review reports due list - Angela Kantola distributed the revised version she posted to the listserv in advance of the meeting.
19. Next meeting, annual researchers meeting:
 - October 16 conference call from 10 a.m. – noon to discuss 2007 Green River floodplain inundation studies (see agenda item #6, above)
 - November 27 Biology Committee regular meeting from 10 a.m. to 5 p.m. in Grand Junction (likely at the Holiday Inn). Agenda items may include review of Pitlick's Colorado River channel monitoring report; review/approval of Modde report: "Investigations of the impacts of smallmouth bass on the fishes of Yampa Canyon"; research needs for spring 2007 (Green R.); discussion of any revised scopes of work; and updates on a white paper on changes to bonytail stocking plan, standardizing the electrofishing fleet, and progress to provide an update on population status and trends. If the agenda grows too long, Kevin and the Program Director's office will work to get things addressed via e-mail in advance.
 - November 28 joint Biology Committee meeting with the Water Acquisition Committee and Green River Ad Hoc Committee on the Green River Study Plan from 8 a.m. to 4 p.m. in Grand Junction (likely at the Holiday Inn). See agenda item #5, above.
 - December 11 – 13 nonnative fish workshop (tentatively scheduled pending confirmation with CDOW) from 12:30 p.m. on December 11 to 4 p.m. on December 13 (or adjourning at noon on the 13th, if possible) in Grand Junction (likely at the Holiday Inn).
 - January 17-18 annual researchers meeting in Grand Junction (Service hosting). >Chuck McAda will have the lead for this with help from the Program Director's office. >Committee members and others are asked to let Chuck and the Program Director's office know if they have ideas/requests for a theme or specific topic areas they believe the meeting should address.

Although the aforementioned meetings all need to be held in Grand Junction, the Biology Committee agreed to try to hold at least one meeting each year on the Front Range (Utah will need to seek approval for any meetings on the Front Range 6-9 weeks in advance and will likely only be able to send one representative).

ADJOURN: 4:30 p.m.

Attachment 1: Assignments from October 3, 2006 meeting (Grand Junction)

Carry over from previous meetings:

1. The Service and Program Director's office will prepare description of the intended process, time frame, and lower basin involvement for the 2007 recovery goal review (perhaps a scope of work). *Pending (Service R6 & R2 discussing; R6 will present*

strategy to R2, CNO & WO in mid-late October).

2. The Committee needs to make a decision regarding stocking or translocating and monitoring pikeminnow before Price-Stubb passage is complete. *Chair/Program Director's office will review past discussions and place on future meeting agenda, if needed.*
3. Tom Pitts will ask the WAC to adopt a report review procedure similar to the Biology Committee's. *Pending.*
4. Tom Nesler will provide George Smith information on the relative abundance of the species in Colorado reservoirs and whether those species have been detected in downstream sampling (this may take awhile, however). *Pending (CDOW has appointed Ellen Hamann to work on this).*
5. Tom Czapla will work with PI's to incorporate full-blown population estimate reports for every set of estimates into their scopes of work. *Ongoing.*
6. John Hawkins will give Pat Nelson an idea of what sort of update is needed for State Parks folks in advance of the next nonnative fish sampling season. *Pending. Hawkins has written up requests from State Parks folks and will share with Pat Nelson. Parks would like information ahead of time; perhaps field personnel can talk to them in advance.*
7. George will make that clear in the GIS scope of work that fish capture data would be password-protected to prevent improper use. George also will talk to Dave Campbell how the similar GIS effort is working out in the San Juan program. *Pending; GIS SOW deferred to 2007.*
8. John Hawkins and Tom Czapla will develop specific recommendations for the use of the fish handling protocol for review at the next meeting. *John Hawkins is continuing to update the protocol. By mid-October John Hawkins and Tom Czapla will survey PI's for any new information and to see if they have any training needs.*

New Assignments

1. Utah will work with Pat Nelson to submit/revise scopes of work to address white sucker removal.
2. Comments on the draft Green River Study Plan are due from the Biology and Water Acquisition committees on November 3rd and should be submitted to the Green River Study Plan Ad Hoc Committee, Biology and Water Acquisition committees ("Kirk E. LaGory" <lagory@anl.gov>, Valdezra@aol.com, Angela_Kantola@fws.gov, Dave_Irving@fws.gov, George_Smith@fws.gov, Larry_Crist@fws.gov, Pat_Nelson@fws.gov, robert_muth@fws.gov, tom_chart@fws.gov, tom_czapla@fws.gov, DSPEAS@uc.usbr.gov, "Heather Patno" <PATNO@wapa.gov>, "Gary Burton" <BURTON@wapa.gov>, christopherkeleher@utah.gov, chuck_mcada@fws.gov, h2orus@waterconsult.com, hayse@anl.gov, jhawk@lamar.colostate.edu, john_wullschleger@nps.gov, jshiel@seo.wyo.gov, kbestgen@cnr.colostate.edu, kevinchristopherson@utah.gov, krissywilson@utah.gov, Kevin.Gelwicks@wgf.state.wy.us, melissa_trammell@nps.gov, PatrickGoddard@utah.gov, terry@cuwcd.com, tim_modde@fws.gov, tom.nesler@state.co.us, trinahedrick@utah.gov, wdavis@ecoplanaz.com, rtenney@crwcd.org, boydclayton@utah.gov, BUILENBERG@uc.usbr.gov,

luecke5@comcast.net, michelle.garrison@state.co.us, MWILSON@gp.usbr.gov, randy.seaholm@state.co.us, mnorman@uc.usbr.gov, tiseman@tnc.org). George Smith will forward the draft plan to the Water Acquisition Committee. Principal investigators of projects referenced in the draft plan also need to review it and submit comments by November 3rd (PI's are asked to particularly review how their projects do or don't address the uncertainties and hypotheses in the study plan to identify any studies which may have been missed in the plan). Program Coordinators will contact PI's with this request. The Biology and Water Acquisition committees will meet with the Green River Study Plan Ad Hoc Committee in Grand Junction from 8 a.m. to 4 p.m. on Tuesday, November 28 to review and hopefully, approve the draft study plan.

3. By October 11, Pat Nelson will prepare a draft recommendation for placing excess razorback sucker in a floodplain this fall for the Committee's consideration. Utah will do some pre-sampling in floodplains (Stirrup, Baeser, Above Brennan, and Johnson). The Biology Committee will discuss on a conference call on October 16 at 10 a.m. (the Program Director's office will send out information on this call).
4. Kevin Bestgen and Rich Valdez will update the research framework scope of work with current due dates, etc. and provide that to the Biology Committee.
5. Tom Czapla will continue to work on bringing Yampa River humpback chub into captivity and will work with the Service and the Park Service to develop a research proposal.
6. Program staff will discuss how Mike Carpenter's time-series monitoring of sediment deposition and erosion at the Jensen Bar can be tied into the USGS SWMS work.
7. The Program Director's office will continue to pursue analysis of stocked razorback sucker and get a scope of work developed. Principal investigators will need to submit their data with their annual reports).
8. The Program Director's office will talk with Tom Blickensderfer and Tom Nesler to confirm the dates for the nonnative fish workshop and will work with an ad hoc committee to set up, organize, and facilitate the workshop.
9. Tom Chart will revise the interim nonnative fish criteria and send it to the Biology Committee; if there are no issues raised within 2 weeks, it will be considered approved for the next year.
10. Chuck McAda will take the lead for the researchers meeting in Grand Junction in January with help from the Program Director's office. Committee members and others are asked to let Chuck and the Program Director's office know if they have ideas/requests for a theme or specific topic areas they believe the meeting should address.

Attachment 2
Summary of Presentation to Biology Committee on the
Draft Study Plan for the Implementation and Evaluation
Of Flow and Temperature Recommendations for Endangered Fishes
In the Green River Downstream of Flaming Gorge Dam

The Flaming Gorge Biological Opinion called for the Bureau of Reclamation, Western Area Power Administration, and the Fish and Wildlife Service to develop a study plan to evaluate the Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam. An ad hoc committee was formed and has prepared the draft plan recently submitted to the Biology Committee.

The purpose of the plan is to identify and recommend monitoring and research projects necessary to implement and evaluate the Green River flow and temperature recommendations, including studies to examine uncertainties of the recommendations and potential adverse effects associated with their implementation.

Specific objectives of the plan are to: 1) demonstrate how results of recently completed, ongoing, or pending monitoring and research projects are being or will be used to implement and evaluate the flow and temperature recommendations, associated uncertainties, and potential adverse effects identified in the Flaming Gorge Dam biological assessment and biological opinion; 2) identify deficiencies in monitoring and research, and prioritize and recommend additional projects to fill important information gaps; 3) develop and recommend a timeline and approach for periodically assessing implementation and evaluation of the flow and temperature recommendations; and 4) recommend modifications to the RIPRAP to incorporate the approved Study Plan and associated projects following standard Recovery Program procedures.

The Study Plan identifies 41 hypotheses, 20 of which are fully addressed and 21 of which are only partially addressed by 33 ongoing or recently completed primary or supporting studies. The Study plan prioritizes 18 of the 21 partially addressed hypotheses and recommends additional studies in 4 categories (from Table A8 in the draft study plan):

A. Floodplain inundation and razorback sucker recruitment in Reach 2.

- 1) Revise and initiate the recruitment study “C6-rz recruitment” to focus on evaluating recruitment of razorback suckers to the mainstem in response to flow recommendations.
- 2) Complete evaluation of recent peak flow studies related to floodplain inundation and entrainment, and determine the need for additional studies.
- 3) Continue annual monitoring of razorback sucker larvae in the mainstem (i.e., light traps, appearance of larvae, and presence of larvae) for use in making year-specific decisions on peak flow timing, magnitude, and duration; and synthesize existing information on drift and its relation to flows and other environmental conditions.

- B. Backwater formation and maintenance for young Colorado pikeminnow in Reach 2
- 1) Determine the relationship of backwater habitat development to sediment availability and peak flows in Reach 2.
 - 2) Evaluate the effect of base flow variability (within-season, within-year, between years) on backwater habitat maintenance and quality (e.g., temperature and productivity).
 - 3) Evaluate the effects of flows on the fish community in backwater habitats, including native and nonnative species.
- C. Nonnative fish populations and control in Reaches 1 and 2
- 1) Determine the influence of flow and temperature recommendations on life history aspects of nonnative fish.
 - 2) Determine spillway entrainment rates of nonnative fish at Flaming Gorge Dam.
- D. Water temperature targets to minimize cold shock and as spawning cues in Reach 1
- 1) Determine the effects of water temperatures on cold shock and spawning in lower Reach 1 and upper Reach 2.

The Green River Study Plan Ad Hoc Committee also made three general recommendations:

- 1) Emphasis on the need for an integrated approach in the implementation of this Study Plan. Many anticipated effects and uncertainties are inter-related; specific study designs and results will need to be integrated to gain a better understanding of the effects of the flow and temperature recommendations.
- 2) Consideration should be given to tradeoffs among potential effects (e.g., base flow magnitudes and temperatures that maximize benefits to native fish while minimizing benefits to nonnative fish; spillway use that minimizes entrainment rates of nonnative fish from the reservoir but maximizes larval entrainment rates in floodplains).
- 3) More integration and synthesis of historic and current information is urged as a first step in the development of sound scientific studies that best address hypotheses and make greater use of existing information. Furthermore, study refinements are important under the principles of adaptive management to ensure that studies remain focused on the current most vital information needs.