AMERICAN WHITEWATER

Nathan T. Fey, Director
Colorado River Stewardship Program
1601 Longs Peak Ave.
Longmont, Colorado 80501
nathan@americanwhitewater.org

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Bureau of Reclamation
Attention: Ms. Pam Adams, LC-2721
P.O. Box 61470
Boulder City, NV 89006-1470
ColoradoRiverBasinStudy@usbr.gov
RE: Colorado River Basin Water Supply and Demand Study

Greetings Ms. Adams and BOR,

American Whitewater (AW) appreciates the opportunity to submit comments on the Colorado River Basin Water Supply and Demand Study (CRBSS, Study). Recognizing the high likelihood that Basin water supply will continue to decline while both demand and population increase, we believe that the Study's comprehensive assessment of plausible scenarios and mitigation and adaptation strategies should facilitate stakeholder discussions leading to anticipatory and collaborative management. With a firm understanding of the important hydrologic needs of various water users and water dependent ecosystems, we appreciate the Study's inclusion of the *Boating Flow Days Metrics* within the *Recreation* resource category of the *System Reliability Metrics* segment of the report. Given the importance of the Basin's ecological resources, AW also commends the inclusion of the *Estimated Conditions for Flow-Dependent Ecological Systems* (in Technical Report D). We would like to thank BOR staff at CADWES and the CRBSS Project Team, for working with us to develop these critical metrics for evaluating river health. We request that BOR considers our comments as the agency continues to refine Basin-wide planning activities while also providing American Whitewater with a 'seat at the table' as deliberations relating to management in the face of imbalances advance. In this role, we would help represent the interests of conservation and river-based recreation interests throughout the Basin in a balanced, collaborative manner.

Interest of American Whitewater

American Whitewater is a national non-profit 501(c)(3) river conservation organization founded in 1954. We have approximately 6000 individual members and 100 local-based affiliate clubs, representing whitewater paddlers across the nation. American Whitewater's mission is to conserve and restore America's whitewater resources and to enhance opportunities to enjoy them safely. Our membership, staff and board have a keen interest in management and streamflows on river segments throughout the Colorado River Basin, their natural character and health, and the outstanding recreational opportunities they provide. A significant number of American Whitewater members reside within the seven

Basin States, and regularly take advantage of these whitewater paddling opportunities. In addition, paddlers from across the country and world regularly visit these rivers for the diverse paddling and natural-immersion opportunities that make the Colorado River Basin a world-class paddling destination.

Adjusting language and making corrections relating to Boating Flow Days Metrics

As mentioned in our report on *Evaluating Flow-Needs in the Upper Colorado River Basin* (Appendix D.2, Attachment A), American Whitewater conducts studies to define recreational flow preferences, providing tools to assist resource managers in balancing water supply and demand strategies. To that end, we provided information on streamflows needed to sustain the whitewater boating resource on certain stream segments within the Basin, with the intent of developing a quantitative metric for evaluating the impacts to existing recreational flow needs under various management strategies. American Whitewater applauds Reclamation's efforts to obtain the *Boating Flow Days Metrics* from CRSS Output through the application of a temporal disaggregation of modeled monthly flows.

On the other hand, we were concerned that Technical Report D and Appendix D.2 seemed overly critical of the flow-preference data we submitted and the methods we used to collect and analyze it. Specifically, p. D-22 states that "it should be recognized that there are alternative study options to the one applied here that relate flow and recreation quality. The inclusion of the results from this particular approach should not be construed as an endorsement of this method by the Basin States or Reclamation". After mentioning several uncertainties, BOR recommends that "future efforts that incorporate this information carefully consider the limitations described here and in further detail in Appendix D.2" (p. D-22). Appendix D.2 reinforces what we would consider an overly critical tone relating to the *Boating Flow Days Metrics* stating that "significant uncertainties exist related to the use of the approach taken by American Whitewater in the Study..." (Appendix D.2-1). Accordingly, we would like to reiterate the merits of the survey methodology as the best available science-based approach, and suggest a more neutral tone relating to the corresponding data. As recognized by BOR on page D-22, this method has been used in many Federal Energy Regulatory Commission (FERC) studies where dam operations impact a whitewater boating resource. As described in our *Draft Summary Report* (Appendix D.2-Attachment A) the methodology developed by Whitaker et al. has been standardized and used to define flow ranges for river-based recreation that have informed resource management and regulatory agencies. Notably, flow studies using this method have informed the management of at least 81 sections of FERC-affected river throughout the US (Appendix D-2, p. A-24). This methodology has also informed multiple Wild and Scenic River's Studies and Federal Resource Management Plans for landscapes managed by US Department of Interior and US Department of Agriculture. We believe that such broad use and acceptance warrants equal recognition in the main text of the

Study relating to section 8.2 in *Technical Report D*. If read alongside Reclamation's tone of uncertainty and opprobrium, this record of acceptance may more accurately portray the appropriate role and reliability of the *Boating Flow Days Metrics*.

In addition to our comments above relating to general tone and presentation, we suggest corrections to two statements relating to the AW-provided data. On page D-22, BOR claims that some of the most significant data limitations relate to low response numbers and non-response bias. It should be noted that while low response numbers could be a limitation, this particular flow study represents a higher number of respondents than most other streamflow studies. Additionally, we believe that BOR has inaccurately defined non-response bias as it relates to our methodology and associated data. Non-response bias must be tested for and is not applicable to an "open" survey, such as a web-based survey because there is no exclusive target respondent group (i.e. a group that surveys were mailed to). It is nearly impossible to quantify the number of actual respondents vs. qualified potential respondents who didn't respond. Non-response bias's normal connotation refers to a situation where respondents choose not to respond or can not respond for a specific reason, making the group of non-responders a non-random group, which in turn can throw off a random sample. (For example, asking how much individuals weigh in a health survey may lead to a large group who think of themselves as overweight not answering the question, therefore skewing the results to a lower average weight). Given that the flow preference survey underpinning our data invited all response and openly sampled a broad range of self identified users (rather than a random sample), and correspondingly that potential non-responders are not identified, there is no plausible effect of how low response numbers or non-response bias (if it were present) would affect our results. Therefore, we contend that the aforementioned language should be modified to exclude non-response bias as an additional component of uncertainty.

We also take issue with the statement on p. D-22 that the flow-experience relationships derived from our surveys show “obvious limitations” given the “extremely broad range of acceptable flows at some locations" pointing specifically to an acceptable boating range of 1,800 to 100,000 cfs at the Colorado River near Cisco, Utah. We contend that this is not an extremely broad range, particularly for a class I – II run on a large volume river. We do not believe that this points to a demonstration of “obvious” limitations to our method’s flow-experience relationship. Rather, it demonstrates a lack of agency understanding of what acceptable flows mean to various whitewater users and underscores the importance of the *Boating Flow Days Metrics*. One reason a broad range of acceptable flows exists on certain sections of river corresponds with channel morphology. In a highly constricted section of river like Gore Canyon in the headwaters, extremely high flows might result in un-usable days. One the other hand, the shape and character of the riverbed in areas like Labyrinth Canyon and Ruby Horsethief may not create un-useable conditions even when peak flows occur.

In regards to BOR's assertion about our data for the Colorado near Cisco, the broad flow range represents a normal and acceptable window of opportunity for different types of recreational users in different craft for a relatively mild stretch of whitewater (again, due to channel morphology). Significantly, there is no correlation between either low response bias or non-response bias and this broad range of acceptable flows. A flow survey with 10 or 100 respondents might both generate average acceptability ratings for a wide range of flows. If anything, a broad range of acceptable flows shows a diverse user group and minimizes the likelihood of unrepresented groups. Ultimately, for this section of river, a significant point is that while the curve identifies the lowest acceptable flow (1800 cfs), it defines a moderate range of optimal flows between 4,000-15,000 cfs. AW would appreciate this feedback being taken into consideration if a revision of the *System Reliability Metrics* portion of the Study occurs.

More Recreation Nodes on Map

American Whitewater provided BOR with acceptable and optimal flows for Whitewater boating for 14 river segments in the Colorado River Basin. BOR listed 8 of these segments in the Study in *Table D-8* and in *Figure D-2*, a Basin-wide map identifying locations of resource categories with defined metrics. AW suggests adding additional nodes to this resource category map, to graphically represent a more complete picture of the whitewater boating resource throughout the Basin. Of the 14 sections listed in *Table D2-1* (Appendix D2-6), our flow preference data for Big Sur, Ruby-Horsetheif, the Lower Gunnison, the Lower White, and Gray, Desolation and Stillwater Canyons are absent from *Table D-8* and in *Figure D-2*. If a revision to the published version is possible, it would be helpful to add nodes to the map representing these points of recreational use, which are accompanied by user-preference data.

Integrate Additional, Existing Streamflow data

In addition to providing information on the whitewater boating resource for the 8 segments of river that were included in the CRBSS, AW has conducted flow studies on a variety of other reaches within the Basin. These include Recreational Flow Needs Assessments for the Dolores River below McPhee Reservoir, and data on sections throughout the Colorado and Yampa river basins that were not included into the CRBSS. Each of these surveys identified the range of flows that provide acceptable recreation opportunities, and the data was compiled consistent with industry-standard methodologies published by the National Park Service. We would appreciate the opportunity to submit this data to BOR for inclusion in the Study (it can be provided to a specific point of contact upon request).

Similarly, American Whitewater will be surveying river users and subsequently quantifying recreational flow preferences on sections of river throughout the Gunnison River Basin during the spring and summer of 2013. In addition to

providing local and regional stakeholders -- such as those representing various interests on the Gunnison Basin Roundtable -- with data on acceptable and optimal flow ranges, we believe that this information would be valuable to the Study and suggest that BOR consider its integration.

In both cases, additional information on recreational flow preferences in significant portions of the Upper Colorado Basin would enable a more holistic and realistic assessment of the needs, potential imbalances and mitigation and adaptation strategies relating to this and other resource categories. Overall, we believe that this added layer of resolution pertaining to the non-consumptive, economically beneficial whitewater boating resource would lead to a more robust CRBSS enabling more accurate assessments of trade-offs between portfolios and more inclusive ongoing management deliberations.

Contextualize Plausibility of Water Supply Scenarios in Executive Summary

The Study's E*xecutive Summary* identifies four plausible water supply scenarios: Observed Resampled, Paleo Resampled, Paleo Conditioned and Downscaled General Circulation Model (GCM). Given the Department of the Interior's significant role in climate change research, including Regional Climate Change Centers, an Energy and Climate Change Council and participation in the US Global Change Research Program, we feel confident that Reclamation is keenly aware that the continuing buildup of anthropogenic greenhouse gasses are forcing Earth's climate to change, and that this will result in a generally warmer and drier Colorado River Basin. We find it slightly misleading then that recently observed hydrologic trends, resampled paleo reconstructions and conditioned paleo reconstructions are essentially allocated more real estate and described with less uncertainty than the Downscaled GCM projections in the *Executive Summary*. Given that descisionmakers may be more likely to read the *Summary*, combined with the fact that almost all climate scientists and US agencies recognize with almost complete certainty that a changing climate is the scenario that will affect the Colorado Basin's future water supply, we find this presentation unrealistic, and potentially a disservice to grounded and accurate planning activities.

While the climate science community would acknowledge uncertainties relating to the precise spatial and temporal impacts of climate change globally and in any particular region, instrumental data indicating that climate is changing is practically unequivocal. So too is data indicating that climate will likely change more dramatically under higher emissions scenarios, and that the Southwest US's hydrology will be significantly impacted. Accordingly, similar language should be included in the executive summary to balance the paragraph on p. ES-5 which describes inherent uncertainties of the Downscaled GCM scenario. While clear and open acknowledgement of these modeling and methodological uncertainties is critical, we contend that language describing the aforementioned near certainties should be included to more accurately convey the Basin's true water supply outlook. In effect, while assessing the future of Colorado Basin supply and demand in the context of recently historic supply is an interesting exercise, that scenario is unlikely. As noted later in the *Executive Summary*,

"futures that consider the Downscaled GCM….scenario…show a high inability to meet resource needs, regardless of the demand scenario and the operation of Lake Powell and Mead". Since this scenario is much more likely than a reoccurrence of the 100-1200 year past, we believe that the document would better serve stakeholders and the national interest if it were very clear about that likelihood.

Conceptual Support for Water Conservation Language, Scenario C

While we recognize and appreciate the fact that "no single option will be sufficient to resolve future projected supply and demand imbalances" (ES-11) and that the different adaptive portfolios reflect the unavoidability of inherent tradeoffs between regions, interests, costs and resources, we applaud BOR's general conclusion that "targeted investments in water conservation, reuse, and augmentation projects can improve the reliability and sustainability of the Colorado River System to meet current and future water needs" (ES-21). Given our role as conservation and recreation analyst-advocates, we support Reclamation's call to action for implementing these types of cost-effective measures, given their ability to help meet municipal, industrial and agricultural needs while keeping river water in natural channels and helping maintain the health of recreational and ecological resources.

Further, we appreciate the development and description of *Portfolio C*, given its focus of efficiently helping meet user needs via technically feasible measures that have a lower environmental impact and emissions footprint. Given that this scenario is low risk, flexible, and aims to enhance ecological and recreational flows while satisfying other Basin needs, we hope that it will be given serious consideration and additional future analysis as strategies to address pending imbalances advance. Because it focuses on less energy and emissions intensive strategies, *Portfolio C* should be viewed as generating an additional benefit to supply side resources. Because this portfolio has a lower climate impact and because climate change will likely be a primary driver of long term water supply in the Basin, a scenario where emissions can be minimized is a step in the right direction to a less arid southwest. Put another way, we view *Portfolio C* as a strategy that could generate positive feedbacks in mitigating and adapting to Basin-wide imbalances.

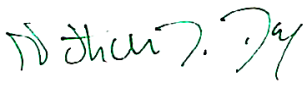
Conclusion

Overall, Reclamation has done an excellent job in compiling the CRBSS and in quantifying the needs of various resource categories, projecting future imbalances and identifying potential mitigation and adaptation strategies. We believe that the Study sets a good foundation for ongoing and hopefully collaborative deliberations to address pending imbalances. Further, we hope and anticipate that consumptive water users can strategically position themselves to more efficiently satisfy needs in ways that do not pose unacceptable risks to

nonconsumptive uses like recreation and ecological flow needs. American Whitewater appreciates Reclamation's inclusion of the *Boating Flow Days Metrics*, but is asking the agency to adjust language in the above mentioned sections of the Study to reflect the merits of our methodology and data, alongside what we consider an overly critical and sometimes inaccurate description of their limitations. Similarly, we hope that Reclamation will consider and integrate our existing, additional streamflow data and our forthcoming (fall 2013) data relating to recreational flow preferences on heavily used sections of river throughout the Dolores, Colorado, Green and Yampa, and Gunnison basins, respectively. We also contend that the Study should more deliberately emphasize that a changing climate is not just one of four plausible future scenarios, but, the most likely future scenario, according to one of the largest bodies of science ever compiled. Finally, we reiterate our intent to remain engaged in this process and to work with the agency and other water users to develop a path forward that minimizes risks to all resource categories while protecting the environment, paddling resources throughout the Basin, and associated recreation-dependent economies.

Thank you for considering our comments and please do not hesitate to contact us for any additional information.

In Cooperation,



Nathan T. Fey
Colorado Stewardship Director
American Whitewater
303 859-8601
nathan@americanwhitewater.org

Chris Menges
Gunnison Basin Stewardship Fellow
American Whitewater
970-596-5078
chris@americanwhitewater.org