COMMENTS RECEIVED ON THE EXPANDED NON-NATIVE AQUATIC SPECIES MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT

Note to Reader: This document presents comments provided by members of the public, stakeholders, federal and state agencies, and American Indian Tribes on the Expanded Non-Native Aquatic Species Management Plan Environmental Assessment released to the public on September 11, 2018. Some of the comments had been submitted online to the National Park Service's Planning, Environment & Public Comment (PEPC) site (https://parkplanning.nps.gov/projectHome.cfm?projectID=74515). Greetings, salutations, and concluding thank you statements have been removed, except in letters provided as attachments to comments. In some cases, the comment system translated commenter input into stray characters that were undecipherable; we have attempted to represent those comments as accurately as possible, but in some cases, ambiguity concerning the commenter's intent remains.

1

Tamarisk no longer considered invasive?

2

Although I value Arizona's native fish species, the Colorado river has experienced dramatic and irreversible changes that are multifactorial. The trout reduction program seems to be a never ending program that will consume large amounts of money and provide limited benefit to the native fish as the brown trout are only one of many factors inhibiting their success. I believe the money from the trout reduction project would be better spent on other threatened/endangered species that have a better long term outlook for survival and success.

3

I agree with the fact that this is a good plan. Native species need to be preserved and protected. However, I would hope that the potentially invasive species that are being removed would not be harmed and be placed back in their natural environment.

4

My heart is filled with sadness. The NPS was once respected as a scientific organization. This plan is short- sited and uninformed by science. Scientists get to the root of a problem. They stand by good scientific findings. The NPS, has AGAIN stood by what is convenient politically. Ignoring ALL science that does not support their most easy and profitable political agenda. As, Albert Einstein said, The same thinking that got us into a problem, is not the thinking that will get us out of the problem.

And, this NPS plan is same thinking that got us into this problem.

Reading the literature on the Glen Canyon dam that is not bought and paid for by politicians and corporations., one discovers people thinking differently. One discovers that the reason for ALL the invasive species invasions is the Glen Canyon Dam. Invasive species cannot be stopped, as long as the Glen Canyon Dam remains standing. Trying to stop these invasions with the Glen

Canyon Dam in place is like throwing money in the middle of the road and setting it on fire. I am 100% AGAINST using my tax money in this manner.

Though it may sound radical. The only sane, common sense, scientific solution to this and a wide variety of ecological tragedies caused by Glen Canyon Dam is to REMOVE GLEN CANYON DAM !!!!

Any good and honest scientist knows the only way to stop the invasive species problem is to REMOVE GLEN CANYON DAM. And, other plan is a waste of tax payer money.

Please, spend my tax money formulating a feasible plan to REMOVE Glen Canyon Dam.

5

Do plan A. Unless we blast and remove Glen Canyon Dam and Hoover Dam, the Colorado river is no longer a viable, slow water/warmer water fishery that it once was. To try to re- stock and reintroduce native warm water fishes into the Colorado and its tributaries is futile- they will not result in long term, self sustaining populations. It is a waste of taxpayer monies to do this. The brown and rainbow trout could easily be advertised as fishable in Bright Angel Creek and the Colorado rivers as a enticement to hikers and tourists who would fish there. Quit trying to "fix" what man has changed permanently. The environment most native fish require is no longer there.

6

Thank you for the presentation in Flagstaff. I fully supportive Tier One proposals and will introduce a motion to have our two local clubs, Grand Canyon Chapter of Trout Unlimited and Northern Arizona Flycasters, to initiate an incentive plan for our members to keep and remove any brown trout caught in the Lees Ferry stretch. This would be in addition to the incentive NPS is proposing and will help achieve the objectives of the EA without having to resort to the much more expensive and problematic actions of Tiers Two and Three.
I am especially concerned with the Tier Two action of mechanical disruption of early life stages at specific spawning sites because of the potential ancillary damage to RBT spawning sites, understanding that the temporal factor may not always pertain.
Further, I am not at all convinced that mechanical means of control can be effective in such a large river, given the multiple possible mini environments RBT and BT share.

7

Thank you for all of the scientific work and publication thereof to all who are interested enough to read through the written work by the learned people listed at the end of the document.

As a Native of Arizona, I have been privileged to witness, either first-hand or second-hand, the building of Glen Canyon Dam and other dams along the Colorado River as well as the construction of the CAP canal originating from the same river almost traversing the State delivering needed water to localities and farmlands. Obviously, there have been many other positive effects from other projects in and around Arizona. However, there have been some negative projects proposed such as closing roads to much of Northwestern Arizona, the Strip country.

Presently, I am opposed to eliminating non-Native aquatic species from the Colorado River below Glen Canyon Dam. The "Control Actions" one of which (among others): introducing chemicals to kill-off non-Native species, is not acceptable to me. I am for preserving the Lees Ferry recreational trout fishery. The Native specie the Humpback Chub is far downstream from this particular trout fishery.

8

I am opposed to mechanical removal of brown trout in Glenn Canyon/Lees Ferry region. I am a sport fisherman but also worry about the environmental effects from mechanical removal.

9

I appreciate the effort that NPS made in responding to the concerns that anglers expresses about electrofishing as a tool for managing the brown trout. Your Tiered approach is much more conservative. My interest is in doing NO HARM to the 350K rainbow trout in the Blue Ribbon Rainbow Trout Fishery at Lee's Ferry. I am the Chairperson of the Public Policy Committee as well as a Board Member of the Zane Grey Chapter of Trout Unlimited. I am a member of the Arizona Flycasters and Desert Flycasters. I attended the session at AZGFD.

My number one comment on the Plan is a concern that there is no executable plan nor any funding for the incentivized harvest in Tier 1. This Tier MUST work, but without funding and a clear, detailed plan, it's a hopeful idea. My concern is that if you don't have a solid plan and execute it well, you will quickly move to the more extreme actions in Tier 2 and 3. You do know how to electrofish, and that is a concern.

Secondly, I would like to see more specifics on how you are going to disrupt the brown trout spawning in Tier 2 and how you are going to make sure that these actions don't adversely affect the spawning grounds for the rainbow trout.

My third concern is that the electrofishing in Tier 3 could have adverse affects on the rainbow trout. The plan calls for repeated cycles of electrofishing (up to 8 cycles of 5 days each?)

My fourth concern is that, while incentivized harvesting might have a positive economic impact on the guide/lodging community, mechanical harvesting could have very negative economic impacts on this community.

And my final concern is that NPS reserves the right to do whatever you deem appropriate, at any time without discussions with AZGFD, the Tribes or the angling community. I would like to see a commitment to collaboration prior to changing course.

10

I am categorically against the ongoing assault on trout in the Colorado River downstream of Glen Canyon Dam by your cooperating agencies and the lobbying groups you support, sympathize with, strategize with, and encourage.

I have been in public service most of my professional life and have observed the symbiotic relationship you have with these groups first hand over many years and many projects. You

make decisions like this and support each other in developing plans and coming to conclusions like this that the rank and file citizen would not agree with. You advertise and meet in obscure and poorly publicized venues to meet the minimal requirements of the law. But you clearly do not want most people to know what you are doing and you do not want to receive comments that oppose your desired courses of action.

You are supposed to have open minds to the "no action" alternatives, but all of your studies, evaluation of alternatives, and recommendations are performed and decided by people who have the same environmental hobby. Nowhere in the process is there someone to put a check on you.

So you make these plans and you really do not go into the public comment period with open minds. You think you know better than everyone else, so you will do what you recommend regardless of what anyone says. You ask for comments, but all you will do with them is count how many of each opinion you get and include that in your report. These comments will have no impact whatsoever on what you actually do.

I vote "NO ACTION". That makes it easy for you to add another no vote. I do it with not hope that it will make any difference.

The trout in the river are the climax species there now. There is a dam. At least in the near future you will not be able to make it go away. This is not the historic river that used to be. The water is clear and cold. It is not warm and sediment filled. It does not have season floods even though you sometimes cause a manufactured one.

How can you pretend like this has not changed and insist that we preserve pre-existing species at pre-existing levels when the entire ecosystem has been so dramatically changed.

The current blue-ribbon trout fishery is absolutely phenomenal. There are few tail water fisheries to rival it in the world. And yet you can't seem to see how truly beautiful, marvelous and "grand" this is. I wish you would spend as much time and effort to preserve the healthy ecosystem that has developed there as you do trying to recreate the past.

Oh well. I'm wasting my cyber breath.

11

I am a full time Arizona resident and frequently fish Lee's Ferry and have for 10 years. In that time I have never caught a brown trout at Lee's Ferry.
The rainbow fishery is up river from the Paria River confluence. If Tier Three action becomes necessary it seems logical the electric shocking should occur downstream from the Paria River for two reasons, 1)It will not disturb the rainbow population at Lee's Ferry and 2)The humpback chub cannot survive in the water at Lee's Ferry because of the water temperature.

12

I believe the tiered approach to managing the Brown Trout is basically a good one. I would like to see what incentive/funding is available for tier one because if it succeeds it could be a win-win

for all the stakeholders. I am very concerned about the tier three approach as to what effect it would have on the rainbow trout fishery.

13
Lees Ferry is a destination of a life time for many of us. Many will only be able to do it one-time in their life. If the tiered system described in the document does not work to satisfaction in the first 2 tiers, the electro shocking will have an serious adverse effect on the rainbow population in the river. This area is already a fragile economic site depending on the fishing/guiding along the river. If the tier three electro shocking takes too many of the rainbows, it will kill the people's liflines they so much depend on, let alone the thousands of fishermen/women hopes of ever fishing in the once great Lees Ferry. There is no guarantee the river will ever recover from this act or if it does how long it will take. The river is just now coming back to form. Please provide a more detailed, and less controversial plan to manage the brown trout and green sunfish in the river.

One of the fishermen that have been able to fish it once! Hopefully to be able to so again.

14
I applaud the additional details added to the plan for a tiered approach. While the effort is a step in the right direction, I agree with many of my fellow anglers that there are still some concerns with how the plan will be implemented. I encourage an additional level of detail to be added. Of particular concern, however, the repeated electroshocking of the rainbows seems to have a high risk of unintended consequences.

Thank you for your consideration.

15
I fish regularly at Lees Ferry. I would welcome the idea of harvesting brown trout by fishermen, but am concerned about the effect that the third tier plan of repeated electroshocking might have on native rainbows. We need more information and detailed planning on this as well as the potential disruption of rainbow spawning beds in any effort to decrease brown trout reproduction.

16
Worrying about a brown trout population that has gone from 2% to 4% seems like a waste of time and resources.

Of the various tiers, Tier One is the best of marginal suggestions.

17
I have been fly fishing for over forty years. I am opposed to shocking the fish in order eliminate the brown trout and Sunfish in the Lee's Ferry fishery.

The best way to help eliminate those two species, in my opinion, is to let AZ Game and Fish regulate the brown trout/sunfish requiring any fish caught within a certain size limit to be retained and not released back to the water. I am opposed to any other method to control these species. This method has the least impact to the fishery.

18
The statement that the NPS has all authority over the brown trout, etc. flies in the face of Director Zinke's comment that AZGFD has authority over wildlife in the state. Moreover, that has been the position held by both the state and federal government for a very long time in our history and it does not seen feasible that NPS gets to declare that null and void. Sounds like a lawsuit to me.

And, whatever action is to be taken likely needs more detail to actually understand what is proposed for both actions and funds.

19
In a river the size of the Colorado I don't believe Brown trout pose a significant risk to other species. Taking action disrupting spawning beds will harm other species. Brown trout have been in this river for many years and do not make up a significant portion of the trout population. I prefer to do nothing approach rather than wasting money and doing harm to the river.

20
Although I dislike the idea of killing any fish, I could live with the incentivized plan to take brown trout. Disrupting brown trout spawning sites concerns me, because I think there could be collateral disruption of rainbow trout spawning sites as well. Similarly, electrofishing for brown trout might also result in the damage to the rainbow trout that will also be electrocuted. I am very much intrigued with the idea of the introduction of YY male brown trout. I learned about this process at the symposium presented earlier this year and I think this might be a great solution. Maybe tiers 2 and 3 could be put on hold and research into YY males could be put on the fast track.

Thank you for taking the time to read my comment.

21
I favor your 3-tier approach and endorse the tier #1 incentivized harvest idea. We do need to know details of how the incentive will work, however. Tier #2 disruption of brown trout spawning areas is concerning in that we don't know details and are concerned that collateral damage may be excessive. Therefore I recommend against it. I oppose Tier #3 as it is expected to cause excessive damage to other than the target fish, i.e. excessive mortality of rainbow trout.

22
Trout Unlimited feels that your plan for disrupting brown trout spawning areas will negatively affect rainbow trout. Also that the electroshocking is excessive and will effect the rainbows. Please review and revise your plans so as to not negatively impact a valuable fishing habitat.

23

Correspondence: Man again has revised what was intended. The building of Glenn Canyon Dam was a mistake and changed an ecosystem. With this change came an opportunity to recreate in what is now a trout fishery. This blue ribbon stretch needs to be protected with the inclusion of the Brown Trout. Don't make a second mistake by destroying what was created. I am a believer in the Endangered Species but that system will never be attainable unless the dam is removed. In the interim allow the wild blue ribbon trout fishery to stay, people's livelihood is now dependent on this fishery.
Please take the time to review any changes to what God or mother nature intended in future projects so that this argument need not be repeated.

24

NPS Mission: The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world. This is where the Parks Service should back away and let this issue be managed by its "Partner" AZGFD. For the recreation and enjoyment of future generations save the Brown trout! There is no evidence that the Brown Trout at Lees Ferry have ANY impact on the species below the Paria riffle. This is overreaching for power by the NPS. The science by the Grand Canyon Monitoring and research department in the joint effort with the AZGFD should be the dominant science.

25

I'm seriously and deeply concerned about any plans to execute brown trout removal at Lees Ferry and adjacent fisheries. I can only anticipate economically negative effects of such a measure and from any logical perspective it also falls very short. If we suddenly and as a rule would consider "non-native species" that by now has been integrated in to our fauna and ecosystem for as long as one or more lifetimes as legitimate "objects for removal", then very few of us humans should be allowed to continue to exist on this land as well. I'm more than just pulling your leg here. In sum, here's what I'm asking you to consider:

1. The EA states that NPS retains all authority over decisions related to brown trout and other non-native fish management actions. These statements are inconsistent with Secretary Zinke's September 10, 2018 letter on State Fish and Wildlife Management on DOI Lands and Water and the 2013 Master Memorandum of Understanding between NPS and the Arizona Game and Fish Commission. Rather, the EA should indicate that all NPS actions related to the Lee Ferry Trout fishery will be coordinated and approved with the AZGFD.
2. The economic impacts of full implementation of all the management actions related to brown trout management are under-stated in the EA
3. More detail needs to be provided on the scope and scale of the project to mechanically disrupt brown trout spawning redds and the resultant impact to the rainbow trout fishery.
4. NPS plans for funding the various actions need to be specified in the EA.
5. The proposed brown trout incentivized harvest program needs to be more clearly described and funding must be sufficient to attract anglers to participate.

26
The Colorado River Energy Distributors Association (CREDA) offers the following comments on the referenced EA. CREDA is generally supportive of the Preferred Alternative, with suggested modifications. We are available to discuss at your convenience.

CREDA submitted scoping comments on this matter on January 2, 2018. Some of those comments are still applicable to this EA:

1. Any action or treatment considered for inclusion in a preferred or selected alternative should have no negative impact to Humpback Chub or Razorback Suckers. 2. Given the identification of grass carp in Lake Powell, an element common to all alternatives must include a robust monitoring program to timely identify and address new non-native threats. 3. Any selected action taken with regard to the RM-12 Sloughs should be one that is intended to be permanent, rather than annual or of some other frequency. This is the most cost-effective, long-term approach with the least likely unintended consequences. 4. Although the EA does not mention other Colorado River-focused programs, CREDA urges NPS to consult and coordinate with the LCRMSCP and UC/SJRIPs regarding non-native species control methods, data and activities. 5. Given the diversity of species, action area and management action quantity and diversity, specific agency roles and responsibilities and funding source(s) should be identified.

General Comments

CREDA offers the following general comments on the EA, with section and page references.

1.2 Purpose and Need, Pages 1 and 2:
Comments: a) The Purpose and Need Statement should be revised to be clear that the tools considered in the EA are non-flow (first sentence 1.2), to comport with the Description of the Proposed Action, and the language contained in the second and third sentences of Section 1.3.2 of this EA. b) The statement that recent increases in Green sunfish and brown trout in the Glen Canyon reach raise concerns about their impacts on Humpback Chub and Razorback Sucker far down the canyon is questionable. Establishing a sound relationship between predatory fish populations in the Glen Canyon reach and prey fish populations many miles downstream has not been done. Speculation about the creation of large populations of brown trout in the Glen Canyon reach is a questionable assumption given the long history of brown trout in the lower river without the creation of a large population upstream in this reach. There is as yet not sufficient evidence the brown trout in the Glen Canyon reach originate from populations near Bright Angel Creek and then pass by the Little Colorado River and its Humpback Chub population en route to upstream areas. Concerns about these same brown trout turning around and now migrating downstream from the Glen Canyon reach impacting Humpback Chub should support appropriate monitoring to ensure that the Glen Canyon reach population doesn't expand to population sizes seen farther downstream. We know the predatory fish mentioned are capable of preying on young humpback and razorback given the right circumstances; control measures for both areas should be established, recognizing resource limitations. Sufficient monitoring should be undertaken to verify hypotheses regarding brown trout origins and movement downstream to determine necessary control measures for brown trout in the Glen Canyon reach,

while maintaining the capability to address known prey fish populations farther downstream.
2.2.2. Page 8, Paragraph 3.

In addition, rainbow trout could be affected incidentally during actions targeting other species. Actions would be designed to minimize the incidental mortality of rainbow trout while still achieving objectives, and adaptive improvements would be considered to further minimize effects to rainbow trout.

Comment: Since the rainbow trout population represents an overwhelming majority of fish present within the area potentially targeted for brown trout removal, any mechanical removal of brown trout through electrofishing will have a disproportionate effect on rainbow trout. Efforts to remove ~3% of the trout with electrofishing (brown trout) will undoubtedly involve shocking the other ~97% of fish (rainbow trout) present with concomitant impacts on their physiology and anatomy. We disagree that individual rainbow trout could be affected incidentally although their population may be. See comment above regarding limited resources and trout control measures.

Table 2.1 M-2. Pages 9 and 10.

The table states the trigger for mechanical removal: Brown trout production in the Glen Canyon reach is an important contributor to the number of adults in the Little Colorado River reach (i.e., the number of adult brown trout in the Glen Canyon reach is > 5,000).

Comment: This control measure states that when the adult brown trout population in the Glen Canyon reach exceeds 5,000, they become an important contributor to the number of adult brown trout in the Little Colorado River reach 65 miles downstream. What is the scientific basis for this statement or for the trigger number? Is there physical evidence the brown trout in the Glen Canyon reach actually will move downstream or is this based solely on a modeling effort? If so, then the implications to the Little Colorado River Humpback Chub to later efforts to stock 100,000 YY-male juveniles and 50,000 adult brown trout in the Glen Canyon reach over a ten-year period should be considered an unacceptable risk, and this experiment should be removed from the Preferred Alternative. If some of the uncertainties associated with this experiment are resolved over time, the action could be reconsidered and reanalyzed. The EA does not provide adequate impacts analysis given the nature of this activity.

2.2.2.1. Page 21.

Re: Targeted harvest control: a) As described, this tool could be implemented for three winters, ending 2021. This would mean that the tool would be implemented in the next 3 months, which doesn't square with the timing of this EA or the current consideration of a fall 2018 high flow experiment (HFE). What is the impact to implementation of this tool vis a vis HFEs? b) The last sentence in this section should be revised to refer to remove communicate with so that consultation also applies to the AMWG and TWG, consistent with the text on page 6. c) The administration and/or funding of these actions could be federal, state, or from a third party should be clarified to exclude the Adaptive Management Program as a funding source.

2.2.2.2. Page 21. Physical Controls

Comment: These sections (see Appendices D.2.1, D.2.2) fail to adequately consider the value of modifying the habitat by using a continuous inflow of cold river water to warm backwaters and thereby prevent successful egg-incubation by warm water non-native fish. A short ditch or pipe permanently installed at the head of the green sunfish RM-12 Slough could deliver cold river water on a continuous basis thereby precluding the need for repeated dewatering by pumping, the use of chemicals or other temporary measures. Over time, a permanent solution should save time, money and human resources. Also, section D.2.2. fails to provide any details for the elimination of piping from further consideration (there were equipment limitations and maintenance issues). Was there any attempt to develop cost and impact comparisons with these permanent solutions, including maintenance, versus the ongoing cost and impacts of annual or more frequent temporary measures and their maintenance? A permanent measure is preferred over repeated application of temporary measures. In addition, a permanent solution would alleviate the proposal to relocate netted green sunfish to Lake Powell. That element of Action P1; Tier 1 appears intuitively to potentially exacerbate the non-native persistence problem. Relocating netted green sunfish to Lake Powell should be removed as an element of the Preferred Alternative.

2.2.2.4. Page 25: Biological Controls

Comment: For all the uncertainties and timeframes outlined in this section, CREDA recommends the YY-Male Fish Experimental Action be removed from the Preferred Alternative. It does not yet appear to be a viable tool as described in the Purpose and Need Statement. Additional technical comments follow:

Page 2.2.3.1 Page 28.

Comment: What evidence is available to support the stocking of YY-male brown trout that will not result in these fish disproportionately moving downstream into the Little Colorado River confluence area? We understand the goal of systematically reducing the number of viable male fish over an extended time period; but, will these newly stocked predatory fish remain where stocked or will they move up- or downstream? Stocking 100,000 juvenile brown trout and 50,000 adults over a ten-year period may be justified from a reproduction standpoint but if they consistently move downstream after stocking, this method with these numbers may cause significant impacts to the Humpback Chub population at the LCR. Also, does the trigger 1c number of 5,000 adult brown trout meant to also include the annual stocked YY-males since their propensity to migrate downstream may be higher than resident brown trout? To insure the method does no harm, an extremely rigorous monitoring effort will be needed if this option is pursued to determine the movements of these newly stocked fish and the method discontinued if downstream movement is detected. In Appendix C-3, page C-6, the modeling shows at the high risk level that stocked YY-male brown trout that have migrated to the Little Colorado River could consume 100% of the annual Humpback Chub production irrespective of the ongoing consumption by existing, naturally-produced brown trout already present. This level of impact from the stocking alternative supports its removal from consideration in the Preferred Alternative or in this EA.

2.2.3.2, Page 29: Control of Non-Natives in Sloughs.

Comment: In addition to our earlier comments and recommendations, we offer the following technical comments: There is no detailed explanation considering the possible use of either a pipe or dredged channel to deliver cold river water into the RM-12 Upper Slough. Reasons for not including this option as described in D.2.1 and D.2.2 are not sufficiently detailed to make the Preferred Alternative complete. We know that green sunfish, like other warm water non-natives, require warm water to reproduce and cold water in the slough will preclude successful reproduction. The river can supply cold water on a consistent basis with the use of a pipe or dredged channel. Once installed, this permanent solution would not need to be constantly repeated in contrast to the options being suggested (e.g., pumping, netting, chemicals, piscicides, concussion, etc.) The sloughs would become merely a cold side channel and warm water non-native fish, like smallmouth bass, walleye and green sunfish, would not be able to use it.

3.1, Page 31: Project Area

Comment: Other than the first sentence, all the text of the second paragraph should be removed. Project Area should be as described in paragraph 1, and the narrative focusing on water and sediment and Dam releases are out of scope. Water quality is included as an Affected Environment in this EA; sediment is not. Flows and Dam releases and the authorized purposes of Glen Canyon Dam are also improperly included in an EA in which Reclamation is not a co-lead or lead agency. Finally, the last sentence The LTEMP represents the most recent effort to identify operations at Glen Canyon Dam that would benefit downstream resources while providing for hydropower generation is not consistent with the LTEMP ROD, is inaccurate and should be deleted.1/

3.5.2.5, Page 63: Cumulative Impacts on Tribal and Cultural Resources

Comment: Paragraph two refers to the LTEMPs vegetation treatments that improve vegetation conditions and could lead to a more natural riparian ecosystem&.. (emphasis added) What is the basis for this conclusion? The vegetation treatments described in LTEMP are experimental, and as such, have not yet been proven as described in this sentence. This same sentence appears to be duplicated in the third paragraph as well.

Humpback Chub is Priority

Given the recent positive actions taken by the USFWS in its issuance of a Species Status Assessment for Humpback Chub, and in addition to the comments noted above, CREDA suggests the following recommendations prioritize Humpback Chub and should be adopted as part of the Preferred Alternative.

Recommendations:
1. Don’t implement a YY-male brown trout stocking program as part of the Preferred Alternative.

2. Install a permanent cold-water inflow system at RM-12 Sloughs to preclude this as a site for warm water non-native fish production that could provide a continuous source of predators to prey on downstream Humpback Chub.
3. Target brown trout that are already in the Little Colorado River confluence reach, and ensure sufficient monitoring is in place to determine when and whether controls in the Glen Canyon reach are necessary.
4. Any action or treatment considered for inclusion in the Preferred Alternative should have no negative impact to Humpback Chub or Razorback Suckers.
5. Table G-2 notes that there is no larval fish sampling proposed below Glen Canyon Dam to detect possible movement of larval warm water non-native fish moving out of Lake Powell. Since this is the likely source of most all warm water non-native fish found below the Dam, it is imperative that early detection of these fish be incorporated at the outset of EA implementation.

CREDA appreciates the EAs inclusion of specific triggers, actions and off-ramps. Given the number of agencies and programs who have responsibilities in the geographic area encompassed by this EA, we suggest additional information be included in the appropriate EA Table(s) that would identify specific agency responsibility for the monitoring, control actions, reporting, decision-making, etc., aspects of the Preferred Alternative.

1/ LTEMP ROD Purpose and Need, p. 2: The purpose of the proposed action is to provide a comprehensive framework for adaptively managing Glen Canyon Dam over the next 20 years consistent with the GCPA and other provisions of applicable Federal law. Further, ROD p. 1: The LTEMP will provide a framework for adaptively managing Glen Canyon Dam operations and other management and experimental actions over the next 20 years, consistent with the Grand Canyon Protection Act (GCPA) and other provisions of applicable Federal law. (emphasis supplied). Finally, ROD p. 1: The LTEMP identified specific options for dam operations (including hourly, daily, and monthly release patterns), non-flow actions, and appropriate experimental and management actions that meet the GCPA's requirements, and maintain or improve hydropower production to the greatest extent practicable, (provide for does not equate to maintain or improve & to the greatest extent practicable) (emphasis supplied).

27
I support the idea proposed in Sec'y Zinke's Memo that all NPS actions relating to the Colorado River, especially those actions contemplated with respect to Brown Trout run the Lees Ferry stretch just below Glen Canyon Dam, be coordinated with and approved by the Arizona Dept. of Game and Fish.
It seems to me that more detail needs to be provided on the scope and scale of the proposed means of mechanical removal of Brown Trout.
The incentivized harvest program, to last for three years, is a good idea. There should be more specificity in describing the funding and means of verification before the program begins.
Thank you for your work and for your consideration of these points.

28
As I reviewed the comments below, some information that I provided in table form did not print in the comment section below. I will mail the full document as well to allow you to review

critical socio-economic data on the lees Ferry area that I hope provides an example of the kind of research needed to determine the impact of this EA on the fishery and the local economy. The bolding that I used in the communication for easy reference on your part is also missing in the comment section below that will be in the printed version I will send to you. Jim Strogen

RE: Comments by Dr. Jim Strogen on the Environmental Assessment for an Expanded Non-native Aquatic Species management Plan below Glen Canyon Dam

There are a number of concerns that I have regarding the EA for the Colorado River below Glen Canyon Dam. Under each concern I will list a reference page to the EA document where appropriate, and provide a one or two paragraph summary of my concern followed by the key point of my concern (bolded). These concerns include:
NPS & AZGFD Cooperation Agreements
Other Related Cooperation issues in EA
Details Lacking in the Incentivized Harvest Tier
Reference Needed to Conservation components of LTEMP in movement to tier 3
Multiple triggers for tier 3 are confusing and misleading
Socioeconomic impact on local community and fishing perceptions of anglers
Use of chemical treatments
Lack of Attention to Root Causes vs. Use of Short Term Ineffective Strategy (Mechanical Removal)
Rainbow Trout Threat
Sloughs
Possible Problems with YY Experimental Plan
Fish Transport Concerns
Aquatic Plants

NPS & AZGFD Cooperation Agreements
The September 10th letter from Secretary Zinke noting the leading role that he expects the states to play in managing areas like Glen Canyon National Recreational Area and Grand Canyon National Park is in direct conflict to the wording and intent written in the EA where it asserts the ability to skip tiers and assume final decision-making authority with regard to NPS prerogative to move to more severe action tiers to control brown trout in the Lees Ferry reach.
The EA must reflect the leading role that states are intended to take in managing areas of joint jurisdiction.

Other Related Cooperation issues in EA
P. 3
Under the Alternatives section the document lists a Master Memo of Understanding (MOU) that in light of Secretary Zinkes letter of September 10th should be reviewed and likely modified to favor the state of Arizona.

P. 6 Triggers may be reviewed at least annually and adjusted based on information as needed. This review would include NPS communication with the GCMRC, U.S. Fish and Wildlife Service (FWS), Reclamation, AZGFD, Tribes, and members of the TWG.

The reference to MAY review is a concern. It also doesnt specify that actions would, but only may be modified. If these other agencies are advising against NPS action or advising adjustments to triggers, their concerns MUST be considered and acted upon.

P. 6 If lower tier actions are determined to be ineffective or triggers for implementation of higher tiers is reached, NPS would implement higher tier action that may require more intensive management. In some cases, conditions may change rapidly, and actions may be elevated through several tiers within the same season if triggers are reached. Some tiers may be skipped if actions or methods are not yet available or determined to be inappropriate for a particular control need.

P. 21 If budget constraints, rapid and/or major changes in populations of brown trout or humpback chub, or other unexpected changes were identified, NPS would consult with AZGFD and traditionally associated Tribes, communicate with the AMWG and TWG, and discuss if implementation of other actions are necessary sooner. As the action agency, NPS retains final decision-making authority.
The idea that budget constraints could override decisions based on science or cause impact to the fishery or the local economy is of great concern.
The reference to consultation is critically important to actions concerning this EA, but the reference to final authority discounts the sincerity of those consultations. The reference to final decision-making authority must be removed to provide credibility to the statement of collaboration.

P 27 2.2.3.1 At a minimum, NPS and AZGFD would meet every 3 years to review triggers. This level of coordination is consistent with the 2013 Memorandum of Understanding between NPS and AZGFD regarding cooperative management of the Lees Ferry fishery.
Consultation with AZGFD at minimum of every three years is not effective cooperation and coordination. The potential for critical decisions and actions regarding this EA in between those three year consultations is highly likely. There MUST be reference in the EA to ongoing consultation and cooperation in managing these joint jurisdiction areas.

Details Lacking in the Incentivized Harvest Tier
There is not sufficient detail about the incentivized harvest tier 1 to assume that appropriate attention to the key components for the success of this tier have been considered. That could lead to unnecessary failure of this tier (as the best and least invasive tool in the plan to the rainbow trout fishery) and cause the NPS to shift to tier 2 prematurely.

All brown trout regardless of size that are caught in the incentivized harvest should be compensated to encourage removal. Perhaps there could be a graduated reimbursement scale based on size. In order to assure that ALL brown trout are killed and counted, perhaps a mechanism to count total inches of all brown trout caught by an angler could be employed. This would discourage release of small fish by an angler because of a fear of not being sufficiently compensated.
Provide a greater degree of detail regarding the Incentivized Harvest plan, including monetary compensation rates. Be sure to provide incentive for catching and keeping ALL brown trout. Strategies to educate the fishing population, engaging fishing guides and fly fishermen used to

catch and release must be detailed in the plan.
Reference Needed to Conservation components of LTEMP in movement to tier 3
Tier 3 in the NPS EA notes the importance of 5,000 adult brown trout as a trigger in the Lees Ferry reach to initiate the extensive electroshocking protocol without reference to the conservation efforts required to be completed prior to that mechanical removal action.
The conservation efforts noted in the LTEMP need to be completed prior to mechanical removal efforts AND included in the description of that aspect of the tier.

LTEMP Conservation Language as it relates to Mechanical Removal:
P.27 LTEMP ROD
2.2.2 Tier 1 Conservation Actions for Humpback Chub under Alternative D
Tier 1 conservation actions designed to improve rearing and recruitment of juvenile humpback chub will be implemented if the combined point estimate for adult (e200 mm) humpback chub in the Colorado River mainstem Little Colorado River aggregation (RM 57-RM 65.9) and in the Little Colorado River falls below 9,000 (2,000 in the mainstem and 7,000 in the Little Colorado River), as estimated by the currently accepted humpback chub population model, or if recruitment of subadult (150 mm-199 mm) humpback chub does not meet or exceed estimated adult mortality (Appendix O of the FEIS). Tier 1 actions will include expanded translocations of YOY humpback chub within the Little Colorado River to areas within the river that have relatively few predators (i.e., above Chute Falls, Big Canyon), or larval fish will be taken to a rearing facility and released in the Little Colorado River inflow area once they reach 150 mm to 200 mm. In addition to these translocation activities, 300 to 750 larval or YOY humpback chub will be collected from the Little Colorado River and reared in a fish hatchery to less vulnerable sizes before releasing them. Once these fish reach 150 mm to 200 mm, they will be translocated to the Little Colorado River in the following year.

2.2.3 Tier 2
Mechanical Removal of Nonnative Fish under Alternative D Mechanical removal of nonnative fish in the Little Colorado River reach (potentially from RM 50-RM 66) will be conducted if the Tier 1 conservation actions described in the previous section were not successful in halting a decline in the number of adult humpback chub. Mechanical removal, using the methods described in Section 2.2.1 and Appendix O of the FEIS, will be conducted if the point estimate of adult humpback chub falls below 7,000 (the trigger level used in Reclamation 2011), as estimated by the currently accepted humpback chub population model. Up to six monthly removal trips (February through July) will be implemented in each year triggered.
Mechanical removal will stop if the predator index is depleted to less than 60 rainbow trout/km (see Appendix O of the FEIS) for at least 2 years in the reach between RM 63 and RM 64.5, and immigration rate is low, or the adult humpback chub population estimates exceed 7,500, and recruitment of subadult chub exceeds adult mortality for at least 2 years.
If humpback chub adult numbers continue to decline and Tier 1 and Tier 2 actions are not working, FWS, in coordination with Reclamation, NPS, and the Tribes, will consider other actions to stop the decline. Triggers will be reviewed and modified as necessary, and actions and triggers will be modified if humpback chub are found to be affected by other factors.
Implementation of mechanical removal will consider resource condition assessments and resource concerns using the processes described in Sections 1.3 and 1.4.

Multiple triggers for tier 3 are confusing and misleading
The EA makes reference to 5,000 adult brown trout as a trigger in the first part of the tier then in a later section in the same tier the use of the figure of over 20,000 adult brown trout is noted as the critical trigger point. This is misleading. Compounding the confusion even further is a reference later in that section that notes that MR will cease in the Lees Ferry reach if the adult brown trout numbers are reduced to below 10,000 adult fish.
I urge you to remove the reference to 5,000 adult brown trout as a trigger and instead maintain the 20,000 trigger with the 10,000 off-ramp.

Socioeconomic impact on local community and fishing perceptions of anglers
The socioeconomic impact on fishing perceptions and the resultant effect on the local economy are significantly discounted in the EA. These claims are unsupported by specific research on the socio-economic impact on the Lees Ferry fishery, local community, county, or state.
The mechanical disruption of redds and the mechanical removal of brown trout will take place in the states only blue ribbon rainbow trout river fishery. These are both likely to take place for extended periods between November 1st through February 28th. The scars from the mechanical disruption of the brown trout redds will be visible to all anglers and cause them to fear for the condition of spawning areas for the rainbow trout and the future of the fishery. Mechanical removal of brown trout by description in the EA outlines 40 continuous nights of electroshocking throughout the entire stretch of river where anglers are pursuing rainbow trout in this world renowned fishery.

There a number of sections in the EA noting the socioeconomic impacts on the EA (p.45, p.65, p.69, p.70) that demonstrate a general lack of awareness based on actual research on the part of the NPS on how the actions of the EA will truly impact fishing satisfaction at Lees Ferry and the resultant impact on business due to the actions specific to the control of brown trout in the Lees Ferry reach.
P. 70 &Adverse impacts under the Proposed Action on the Lees Ferry trout fishery (see Section 3.3) and subsequent impacts on recreational economics are expected to be limited and outweighed by the beneficial effects on recreational economics of non-native aquatic species control. Interaction and accumulation of adverse impacts on socioeconomics from multiple control actions under the Proposed Action would be limited because (1) most individual actions and their effects would persist for less than a week, (2) most actions would occur in small (<5ac) habitats that are isolated from the main channel and each other, and (3) tiered implementation of actions would reduce the potential for them to occur simultaneously at specific locations. Because of limitations on adverse effects and net benefit of the Proposed Action, an overall reduction in cumulative impacts on socioeconomics is expected.

This is perhaps the most disturbing misrepresentation of the impact of control actions in the EA. The wording of this paragraph discounts the potential significant impact of redd disturbance and MR on the fishing experience of anglers and the resultant impact on businesses by adding up all of the various strategies in the plan that will have minimal impact then saying cumulatively they will have little impact. Those other actions are of little concern to most anglers. Redd disruption and mechanical removal of brown trout are of primary concern, and both will require several nights, if not weeks of action. One will leave visible scars in the river, the other will alter the condition of rainbow trout and make them less catchable. The mechanical removal action could

cause mortality to rainbow trout. Both redd disruption and mechanical removal will be known to the fishing community and negatively alter the fishing success perception of anglers and impact the local economy during the action; and quite possibly long-term.

In addition, the following reference causes great concern because the impact of unknown actions cannot be measured: Appendix C Supplemental Descriptions of Control Actions Under the Proposed Action (for Brown Trout). It notes This appendix provides additional supplemental descriptions of certain (but not all) control actions that would be considered for use under the Proposed Action. (My italics added).
This reference is of concern, because it seems to allow any and all actions not described in the EA to be considered in the future. This reference needs to be modified to list ALL actions being proposed with full descriptions included.

P. 70 Although not expected, there is the potential for the collective or repeated use of some or all of the potential actions of the Proposed Action to harm the Lees Ferry rainbow trout fishery or result in a negative public perception of the fishery. If this occurred, the actions could have adverse impacts on the local economy that relies on the fishery. Regular monitoring, triggers, and off-ramps are expected to detect any such effect and allow for responsive action to prevent adverse impacts. Mitigation actions, implemented in coordination with AZGFD, would also be applied as needed to maintain a high-quality fishery. NPS would work with AZGFD to develop long-term approvals to mitigate any such effects on the fishery and local economy through stocking the fishery as needed.

This reference acknowledges the negative impact, but poses an easily remedied solution by shifting the responsibility to the AZGFD. As committed as the NPS is to MR for brown trout and the pronouncement of final authority to move to more severe tiers, it seems implausible that these MR actions will be discontinued once started. Coupled with that concern is the reference to AZGFD being responsible for mitigating the effect of the MR thought a rigorous stocking plan. That is unfair and unrealistic. AZGFD has limited windows for acquiring fish that can be dedicated to such a stocking, they have been stymied for approximately two years in their effort to stock triploid rainbow trout as prescribed in the LTEMP when catch rates fall. This reference sets AZGFD to take the blame with anglers if the fishery suffers because the EA describes the long-term approvals granted by the NPS that will be in place to accomplish remediation.

The following economic data collected through GCMRC and based on AZGFD survey data notes the vital economic benefit Lees Ferry brings to the local economy, Coconino County and the state. It is an example of the type of research that needs to be expanded on to measure the impact of this EA.
The following references provide data on the importance of the Lees Ferry Fishery:
1) 2013 Economic Impact of Fishing in Arizona. Conducted for the Arizona Game and Fish Department by Anthony Fedler, PhD., and Responsive Management. 2014.
2) Arizona Anglers Opinions, Attitudes, and Expenditures in the State. Conducted for the Arizona Game and Fish Department by Responsive Management. 2014.
3) Economic Analysis of Glen Canyon Angler and Grand Canyon Whitewater Visitors Surveys. Prepared for: US Geological Survey-Grand Canyon Monitoring and Research Center by Dr. John Duffield, Chris Neher, and Dr. David Patterson. University of Montana, Department of

Mathematical Sciences. 9/1/2016.

2013 Economic Impact of Fishing in Arizona. Conducted for the Arizona Game and Fish Department by Anthony Fedler, PhD., and Responsive Management. 2014.

Table 10a: Economic Impacts of Fishing by Watershed and Waterbody p.28
(Lees Ferry and Lake Powell highlighted by Jim Strogen for comparison)

Information that I felt was important for consideration from Economic Analysis of Glen Canyon Angler and Grand Canyon Whitewater Visitors Surveys. Prepared for: US Geological Survey-Grand Canyon Monitoring and Research Center by Dr. John Duffield, Chris Neher, and Dr. David Patterson. University of Montana, Department of Mathematical Sciences. 9/1/2016.

Table 6. Characteristics of Glen Canyon Angler Trips. p.42

Table 8. Characteristics of Transportation for a Glen Canyon Angler Trip. p.46

Table 9. Average Total Trip Expense (Guided vs. Unguided Angler Trips). p.48

The report noted :Table 9 shows that guided anglers reported spending over 2.5 times as much as non-guided anglers on their trips, and nearly three times the spending of non-guided anglers in the local Glen Canyon region. p.46
This spending by guided anglers included such expenses as: airfare (11.2%), car rental (6.1%), gas and oil (6.9%), food and beverage (5.5%), restaurant meals (10.3%), lodging (20.4%), camping fees (1.0%), personal gear (2.0%), boat gear (1.6%), Native American art and craft items (1.7%), guide fees (31.1%), other (2.1%)-as noted from pie charts on p. 47.

Information that I felt was of particular interest from Arizona Anglers Opinions, Attitudes, and Expenditures in the State. Conducted for the Arizona Game and Fish Department by Responsive Management. 2014.

The 2013 angler survey information for this report provided interesting information.

The most popular species fished:
69% of anglers fished for trout (68% for non-native such as rainbow, and 17% for native trout)
63% of anglers fished for bass
30% of anglers fished for catfish
21% of anglers foisted for crappies
13% of anglers fished for sunfish

The 2013 survey asked species fished, percent of time spent fishing for each species, and days fished:
Bass for 39.7% of angler days; 2.55 million days
Non-native trout for 36.8% of angler days; 2.36million days

The 2013 survey asked one preferred species to fish for in Arizona.

Trout (41%)
Bass (31%)
Catfish (7%)
Walleye (7%)
Crappie (6%)

Q117-Q141. Percent of active anglers who fished in each of the following locations. (Asked of those who personally fished in Arizona in 2013.) (Part1) p.45
In this table Lees Ferry was tied for the tenth most popular destination in the state with 5.7% of angler responses. Others in the top ten: Roosevelt Lake (18.4%), Lake Pleasant (14.2%), Big Lake (12.3%), Canyon Lake (9.8%), Bartlett Lake (9.6%), Woods Canyon Lake (9.6%), Saguaro Lake (9.4%), Willow Springs Lake (8.4%), Apache Lake (6.9%), Patagonia Lake (5.7%).

Q 234. Where did you go on your most recent fishing trip in Arizona in 2013? (Asked of those who personally fished in Arizona in 2013.) (Part1) p.55
In this table Lees Ferry was tied for tenth most recent trip destination in Arizona (2.8%). Others in the top ten: Lake Pleasant (7.0%), Roosevelt Lake (6.7%), Big Lake (4.6%), Saguaro Lake (3.9%), Woods Canyon lake (3.8%), Bartlett Lake (3.7%), Lake Havasu (3.7%), Canyon Lake (3.2%), Patagonia Lake (2.9%), Willow Springs Lake (2.8%)

What is significant about a top 10 place in these lists is that almost all of the other fishing destinations are within an hour of the Phoenix metro area, where the majority of the states population resides. Traveling over four hours to fish at Lees Ferry points to the value that anglers place on this fishery.

The economic data collected through GCMRC and based on AZGFD survey data notes the vital economic benefit Lees Ferry brings to the local economy, Coconino County and the state.
To claim that there will be little to no impact on fishing satisfaction or the resultant impact on the local economy due to mechanical disruption of redds and mechanical removal of brown trout that will also impact the condition and ability to catch rainbow trout that have been electroshocked for several nights is not realistic. Further research into the real economic impact of these two actions is needed and must be included in the EA.

Use of chemical treatments

P.20, P.49
Footnote e talks about actions that have been in place for 5 years as a trigger to reevaluate and move to another potentially more effective action. This footnote often references chemical treatments, such as rotenone use. The fact that in some cases chemical treatments have been used in the same area for multiple events since 2015 points to the need to address root causes of the problem rather than ongoing chemical treatment as a substitute for lack of attention to that root cause.
There needs to be clarity in the document about the timeline of use of particular chemical treatments prior to this EA. Those earlier treatments must be counted in determining the effective use of a particular treatment plan.

Lack of Attention to Root Causes vs. Use of Short Term Ineffective Strategy (Mechanical Removal)
P.37 The document notes that It is unclear if flow operations, including recent fall HFEs, and/or upstream migration of adult brown trout are driving the increase in brown trout in recent years (Runge et al. 2018).
E-7 Green sunfish passage through the dam, either through the fish friendly turbines or during HFE events are considered the primary source of these re-invasions of the small (approximately 0.3 acre) off-channel slough.

Reliance on electroshocking in tier 3 of the NPS EA is a questionable management tool in a large river environment to effectively control populations. Leveraging possible root causes such as temperature, high flow events, and even the continued movement of other invasive species through Glen Canyon Dam into the river, which are not part of the NPS EA, would have a potentially greater positive impact on long-term control efforts. As you know, some of those warm water invasive species like striped bass, smallmouth bass, and walleye could be even more of a threat in the warm water reaches in and near the LCR than brown trout. Again, electroshocking in a large river environment isn't the solution, but long-term actions that address the root cause of any increase are.
There is no part of this EA that addresses the need to eliminate root causes such as the impact of dam operations as a source of increases in brown trout or the many warm water invasive that are coming downriver through the Glen Canyon Dam. The many warm water fish species decimated the warm water native fish population in the Upper Colorado River basin. Preventing their access through the dam to the native populations below should be a primary concern. The NPS may not have control over dam operations, but this threat of the many invasive coming down through the dam must be a priority that you continue to stress in your plans and ongoing collaboration efforts with cooperating agencies. The cost of eradicating invasive species coming through the dam should be entered into the cost/benefit calculations of such a project.

Rainbow Trout Threat
P. 36 Rainbow trout pose a low level of threat in Glen Canyon reach, where they are managed to support a recreational trout fishery, but are considered to pose a high-level of threat in Grand Canyon National Park where emphasis is on native fish conservation Table F-1).

Rainbow trout are not listed in Table F-1, yet are referenced as a medium height very high level threat on E-8. Part of the confusion is that GCNRA and GCNP view rainbow trout differently. The actual status of rainbow trout needs clarification in this EA document.

Sloughs
P.29, D-1 (D.2.1) 2.2.3.2 Channelization from Colorado River Main Channel to or through the Upper Slough (Reclamation Option 1.1 and 1.2)
Even though it has been discounted in D-2 as being too costly, why not pursue infusion of cold water on a permanent basis into the sloughs to not only eliminate green sunfish, but discourage the many other warm water invasive species that are being transported through the dam? This strategy should be reconsidered since it is referenced in the LTEMP as a strategy to be pursued.

P. 41 Placement of Weirs or Barriers.

The use of weirs in sloughs seems to miss the point that although fish in the lower slough may be captured by a weir (but the opening is very large!) the upper slough seems populated by HFEs from upriver where a weir would seem ineffective.

Possible Problems with YY Experimental Plan
P.10, P.47
YY brown trout experiment is noted as not being a tier. My concerns with it are: a PR issue of why brown trout are being stocked at perhaps 5,000 fish while MR efforts are going on that disrupt the RT fishery for the very same fish. Also, there needs to be clear methods for distinguishing the YY trout from the wild trout so that their numbers are not added to the brown trout count for triggering purposes. These fish will also complicate any Incentivized Harvest efforts.

Fish Transport Concerns
P.14 M2.
Fish transport results in too many potential additional threats to the entire watershed to be considered.

Aquatic Plants
P.19 M4.
Concern that MR of non-native aquatic plants and algae may result in drift and further expansion of the problem downriver.

P.19 C5.
Application of herbicides to backwaters and off-channel areas. How are these herbicides going to be contained within those areas and not allowed to enter the mainstream?

Thank you for your consideration,

29
I am submitting comments regarding the Environmental Assessment (EA) for an Expanded Non-native Aquatic Species Management Plan in Glen Canyon National Recreation Area and Grand Canyon National Park below the Glen Canyon Dam.

As a fisherman who enjoys what Lees Ferry of the Colorado River offers, I understand as others do the need to manage the fishery to be world class. I, and others, have been informed there have been increases in potentially harmful non-native fish but believe the measure proposed of mechanical removal is excessive to address any factual and immediate concerns for resolution.

I agree in the need for the various stakeholders (National Park Service, Arizona Game and Fish Department, US Fish and Wildlife Service and others, including the angling community) to review and reach a consensus on the changes needed to the current management plans to address the increase of potentially harmful non-native aquatic species.

While existing measures may be determined to be inadequate, the use of mechanical removal

(Tier 2 & 3) is a very bad alternative compared to others mentioned. Electroshocking, especially repeated occurrences, will be detrimental to the rainbow fishery.

I encourage and support the adoption of Tier 1 to provide an incentivized harvest method to control what may be currently deemed to be an issue. IF Tier 1 is deemed to be not as effective as needed then the "triggers" mentioned in the Tier 1 proposal should be considered by all stakeholders.

More than the fishery is at stake. The local economy will be affected, positively or negatively, by the decisions that are reached.

Please consider the various outcomes on the fishery and economy that will result from the decisions of this proceeding.

30

I've been an avid fly fisherman for over 40 years throughout the Rocky mountains. I've followed projects like this and most all end in disaster. While you try and manipulate habitat for one species you destroy another. Leave the brown trout alone above Lee's Ferry it a wonderful area with great fishing.

31

This is a reach. Leave the trout alone, or better yet improve the fishery. The dam changed this environment, forever. Any action to try to overcome that has had marginal impact since this "money suck" started in the early 1990's. As a tax participant, ie I help pay the bills around this place I'm saying cease this waste of money, and resources. Again as a tax payer I say no more, as a sportsman I say do not waste the resource.

32

Leave the fish at lees ferry alone. I have always felt that biologists should manage our wildlife and keep the Govt out of the process. Brown trout were stocked all over the west in the early 1900's and have kept anglers happy. Sometimes you cannot undo what has been done. Let each game and fish dept decide how to manage our wildlife. Is NPS going to go into Montana as an example and try to do the same thing? Leave the fishery alone please.

33

Thank you for the opportunity to comment.
Please, please do not do any more harm to the fishery at Lee's ferry.
The fishing is finally great again and now the Park Service wants to mess it up and get rid of the brown trout.
This is so backwards and sounds just like the Park Service.
You all screwed with the fishery before so badly that you lost all the beaches and big rainbow trout.
Please, please leave this alone and let it be!
All you all do is make it worse for the anglers, and I was informed by a Park Service Employee at the boat ramp at Lee's Ferry that the anglers do not matter to them, just the river runners!

It was the big fat lady park ranger who yells at everyone.
She let out the truth, so I do not believe you really care about how the anglers feel.

34
I read the Sept 2018 EA for the Glen Canyon reach. While difficult to read, I was able to identify two major concerns.

First, the maintenance of the 5-Star blue ribbon trout fishery from the dam to Lees Ferry takes a back seat. This recreational fishery has been a naturally maintained fishery since at least the 80s, and is now the best of all trout fisheries in AZ. The fishery needs to be the highest priority. I have actively fished Lees Ferry since 2009, and have never caught or seen a brown trout. I have hooked and released a 20 inch plus Colorado Pikeminnow. Electro-mechanical removal of brown trout, which your numbers show at 1.5% of the total trout population, is a very drastic move. An electro-mechanical operation would significantly stress the rainbow trout fishery, which does struggle with a food supply impacted by dam operations, and ill-advised large water releases in November (of all months) to simulate floods. I cannot overemphasize the collateral damage that could, and likely would be done.
Second, while I applaud the tiered approach added since the previous plan version, your wording indicates NPS reserves all rights to act without regard to the other stakeholders. This cavalier wording is a big mistake. AZGF, anglers, and the tribes need to be part of the decision to jump to the next tier. I see the tier criteria, but the environment may have changed. Consensus is needed. Also, if NPS simply forges ahead, the trust level between NPS and the three other stakeholders will take a dive.

I appreciate the opportunity to comment. NPS has been open to all stakeholders during the planning process. I encourage you to elevate preservation of the best trout fishery in AZ to the highest priority; and, I strongly advise you to implement the final plan in coordination with all stakeholders.
Sincerely,

35
Western Area Power Administration (WAPA) is participating as a cooperating agency and has been an active participant during the development of the Environmental Assessment for the National Park Service Expanded Non-Native Aquatic Species Management Plan. We appreciate the opportunity to comment on the Public Draft document. WAPA supports the National Park Service (NPS) effort to control nonnative aquatic species in Glen Canyon National Recreation Area (GCNRA) and Grand Canyon National Park (GCNP). In general, the EA is comprehensive and well prepared. We provide the following comments for consideration in developing the Final Draft of the EA.

A permanent solution for managing the repeated invasions of green sunfish in the upper slough should be considered rather than solutions that require long-term maintenance or repeated chemical treatment. We support a permanent solution, even if that solution is more difficult or expensive to implement.

Green sunfish were able to re-invade the upper slough in 2018 even though there had not been an HFE since the last treatment. This indicates green sunfish can get into the upper slough under normal operating conditions and are not reliant on HFEs for re-colonization as previously thought. Peak flows between the treatment in 2017 and when they were found in the upper slough in 2018 were approximately 17,000 cfs (January, March, and June of 2018). Action P1, however, specifies that dewatering the upper slough would be triggered only after a release >23,000 cfs (Table 2-1, page 9). The trigger for P1 should be adjusted to reflect a lower release volume of approximately 17,000 cfs.

The EA should include an economic evaluation describing the impacts mechanical removal of brown trout will have on the angling, guiding, and services sector of the Marble Canyon business community. Each mechanical removal trip would result in a "2-3 day reduction in catchability of rainbow trout in GCNRA" (Table A-1, pg A-6). If triggered, NPS is proposing to conduct up to eight completed passes of the entire Glen Canyon Reach between November 1 and February 28 with each pass taking five days to complete. This would result in a reduction of catchability for approximately 64 days per year. The EA suggests that "...brown trout control in the Glen Canyon reach is likely to occur relatively infrequently and result in only negligible disruption of angling with little adverse economic impact and potentially a benefit if the action successfully improves the rainbow trout fishery as intended" (Sec. 3.7.1.2. pg 69). We were unable to find a discussion of the probability or frequency of having to conduct mechanical removals, or an evaluation in the EA of how NPS determined that this action would only negligibly disrupt angling and result in little adverse economic impact to the Marble Canyon business community. We suggest that the NPS re-evaluate the assessment and better address how often mechanical removal would be triggered and what impact those removal trips (presumably up to a 64-day reduction in catchability of the fishery per year) would have on the Marble Canyon business community.

NPS should work closely with the Bureau of Reclamation (Reclamation) and its Glen Canyon Dam Adaptive Management Program (GCDAMP) partners to investigate and mitigate the root causes of nonnative aquatic species invasions to avoid having to use measures that attempt to control or remove new or expanding populations.

WAPA requests that all Cooperating Agency Draft and Public Draft comments be made available to the public in their entirety.

WAPA encourages NPS, Reclamation, AZGF, and other management agencies to work together to understand the interactions between native and non-native fish and the habitats and conditions that support them. WAPA appreciates being included as a cooperating agency and supports continued cooperative efforts to manage non-native aquatic species below Glen Canyon Dam.

36
2 key points:

The economic impact of the brown trout removal was not sufficiently addressed. Trout removal will negatively impact the businesses and guides - people who earn their living on the water.

Secondly, this is not a wild river anymore. It's a tailwater - and it should be managed as such.

The native fish would never have been "native" in 50 degree water.

Please leave the brown trout - and all of the trout in the Lees Ferry area be.

37

Thank you for this opportunity to provide comments on National Park Service's Expanded Non-native Aquatic Species Management Plan and Environmental Assessment. Since 1919, the nonpartisan National Parks Conservation Association has been the leading voice in safeguarding our national parks. NPCA and its 1.3 million members and supporters work together to protect and preserve our nation's most iconic and inspirational places for future generations. We serve as representatives of the conservation community on the Glen Canyon Dam's Adaptive Management Program's advisory group.

This reach of the river has the healthiest population of native fish found anywhere on the Colorado River. Yet it is vulnerable to horrific impacts should non-native aquatic species enter this region, species that have caused so much damage elsewhere.

It will take planning, monitoring, and taking decisive action when non-native threats occur, combined with pro-active work to prevent the conditions that lead to non-native aquatic species coming in, to maintain this healthy population.

This Environmental Assessment shows that the Park Service is developing the monitoring needed to find problems when they first start, with the flexibility to act quickly so that small problems don't become large crises.

It makes sense that mechanical removal of brown trout remains as a possible important safeguard. But we are pleased to see that by using a tiered approach, this would be only used as an option of last resort.

Likewise, channelizing the sloughs in Glen Canyon where Green Sunfish have been a problem - which would be a permanent modification to natural habitat - - should be a last resort. This wetland created by springs is a precious place, despite it being an invasive haven. Other methods of eliminating Sunfish and other invasive species, methods that would not destroy the sloughs, should be exhausted first.

National Park Service is not the only agency concerned with invasive species in this reach of the Colorado River, and needs to continue working with all agencies and stakeholders involved to look at all ways to affect the non-native problem. And not just in this segment of the watershed - but throughout the entire basin and in collaboration other jurisdictions and tribes.

We encourage NPS to continue working with the state of Arizona cooperatively on this problem, while maintaining their own important stewardship mission. In contrast to recent ill-considered Department of Interior edicts to turn more management of wildlife over to the states, NPS has more restrictive regulations because that is their mandate and it cannot be changed administratively. Not all public lands have the consumptive use of wildlife as the highest mandate, and certainly not the Park Service. Nevertheless, the mix of state and federal

involvement in this set of problems is very well aligned and balanced, and we hope continues.

The mission behind this environmental compliance is so very important. Invasive species can impact specific vulnerable native species, eventually changing the nature of the ecosystem. The Park Service and cooperating agencies need all the tools and flexibility available in their toolbox to react to this threat. We applaud this EA as providing the environmental compliance that will make them available if needed. Not all may ever need to be deployed, but the bigger the set of tools, the most likely that problems and crises can be dealt with.

Finally, we must recognize that ongoing climate change will make this situation more problematic. Higher temperatures, more erratic rainfall patterns, and stronger storms are expected, and could favor non-native over native species.

Again, we appreciate the opportunity to comment on this draft Environmental Assessment.

38

I think this is a ridiculous waste of taxpayers money. Another case of man trying to control biology. Big fish eat little fish. Always have, always will. Instead of trying to control fish. How about looking into changing catch limits. Or better yet. Protecting these fisheries from pollution.

39

I do not support mechanical means of removing brown trout in the Colorado River. What prevents this method from destroying other species of aquatic life and upsetting the balance of the river. Also, flushing the brown trout nest areas in the river will increase sediment flowing in the river. What problems will that create? How accurate is the population numbers for the brown trout? Has the method being used to estimate brown trout proven to be accurate?

40

We are writing to provide comments on the September 2018 Public Review Draft of the National Park Service's (NPS) Environmental Assessment (EA) for an Expanded Non-native Aquatic Species Management Plan in Grand Canyon National Park and Glen Canyon National Recreation Area below Glen Canyon Dam. Since 1964, with the completion of the Glen Canyon Dam, the Lees Ferry tailwater has hosted a recreational trout fishery that has grown in importance and reputation locally, regionally, nationally, and internationally. This blue-ribbon recreational sport fishery has also become a financial and economic mainstay for the small community of Marble Canyon and Coconino County, supporting fishing guide services, hotels, restaurants, fishing and outdoor recreation equipment and supplies, and visitor services.

It is apparent and appreciated that the initial proposed scoping approaches to brown trout management in Glen Canyon have evolved into a more balanced and structured approach. In our previous comments we raised major concerns that the proposed use of long-term intensive and repeated electrofishing to manage brown trout in the Glen Canyon reach would have a significant adverse impact on the quality of the Lee Ferry trout fishery, the welfare of the local community, and the regional economic benefits tied to the fishery. As such, we support the changes to the proposed action that relegates the use of long-term intensive and repeated electrofishing to a last

resort option for managing brown trout in the Glen Canyon reach based on the direct threat that brown trout pose to humpback chub.

Our major comments and concerns on the EA's follow. Attachment 1 provides specific recommendations, questions and/or changes to the text.

Role of the Arizona Game and Fish Department:

The acknowledgment of shared participation in management decisions by Arizona Game and Fish Department (AGFD) with Federal agencies is of particular importance in managing nonnative aquatic species and protecting the Glen Canyon rainbow trout fishery. Section 2, Alternative, of the EA states: "..... the NPS and Arizona Game and Fish Department will continue to work cooperatively to manage fish and wildlife resources on NPS lands as articulated in the CFMP and the 2013 Master Memorandum of Understanding (MOU) between United States Department of the Interior National Park Service Intermountain Regional Office and State of Arizona Game and Fish Commission. Nothing in this EA would change anything in that relationship or any understanding of the jurisdiction or cooperation related to the fishery."

On September 10, 2018 the Secretary of the Interior's (SOI) issued a memo to DOI agencies that "..reaffirms the authority of the States to exercise their broad trustee and police powers as stewards of the Nation's fish and wildlife species on public lands and waters under the jurisdiction of the Department. Each [DOI agency] must recognize the fundamental roles of the States in fish and wildlife management, especially where States have primary authority and responsibility, foster improved conservation of fish and wildlife, and encourage a good neighbor policy with the States." and "â€¦the States fundamental responsibility for fish and wildlife management includes responsibility for appropriate regulation of public use and enjoyment of fish and wildlife species. The Department recognizes States as the first line authorities for fish and wildlife management and hereby expresses its commitment to defer to the States in this regard except as otherwise required by Federal law."

There appear to be instances in the EA where the decision-making process is not consistent or compliant with the MOU and/or the SOI's memo. The EA currently states that NPS has "final decision-making authority" on all actions. For example, on page 20 the EA states: "If budget constraints, rapid and/or major changes in populations of brown trout or humpback chub, or other unexpected changes were identified, NPS would consult with AGFD and traditionally associated Tribes, communicate with the AMWG and TWG, and discuss if implementations of other actions are necessary sooner. As the action agency, NPS retains final decision-making authority." In lieu of this statement, the EA should reference the SOI September 10, 2018 memo and the MOU and clearly state that all proposed actions will be carried out in coordination with and upon concurrence from the AGFD.

Incentivized Harvest Program

We appreciate and support the implementation of an incentivized brown trout removal as an initial first step effort. Based on broad opposition to mechanical removal by Native Americans and the angling community we believe it will much more feasible and cost effective to

implement an incentive harvest program than the mechanical removal effort described in Tier 3. While the EA includes a general description of the program, details for funding, implementation and operation are not included. Those details and how they are arrived at will determine success or failure and should be included in the EA. The support and participation of the angling and guiding communities will be an integral part of the outcome. The EA should also discuss how anglers and guides will be involved in the planning process. The financial reward for each harvested brown trout will be determinative in attracting anglers to participate in the program, particularly in consideration of the relatively small number of brown trout in Glen Canyon and the difficulty in catching them. We believe the minimum reward should range between $50 and $150 per fish depending on the total number of brown trout being harvested. The total amount of funding for the program should be comparable to the cost of implementing the mechanical removal efforts outlined under Tier 3.

The EA proposes "testing" the incentivized harvest program for three winters prior to implementing other brown trout actions in the Glen Canyon reach. Assuming the program is properly funded, planned and marketed, we believe three complete winters would be the minimum time required to evaluate the operation and effectiveness of the Program. However, the EA proposes the unrealistic date of October 31, 2021 for completing three-year test. Assuming FY 2019 will be used for program planning with implementation beginning in December 2019, this date be extended to October 31, 2022.

Mechanical Disruption of Brown Trout spawning sites in Glen Canyon

A Tier 2 activity involves the mechanical disruption of early life stage habitats at specific brown trout spawning sites, including high-pressure water flushing and mechanical gravel displacement. The EA does not include sufficient detail on the scale and geographic scope of this activity in order for us to comment on its likely effectiveness or the impacts it may cause to the rainbow trout fishery. If brown trout spawning is widespread throughout Glen Canyon we question whether this technique will be successful at reducing overall brown trout spawning or recruitment. However, currently there is limited knowledge on the geographic areas where brown trout spawning exists. Prior to implementing this action, more detailed data should be gathered on the location and distribution of brown trout spawning areas.

Funding

Adequate funding will be a determinative factor in the successful implementation of the actions outlined in the EA. Currently, the EA is unclear on how much the various management actions will cost or how they will be paid for. As noted above, the amount funding to implement the incentivized harvest program including the amount of the reward offered for each harvested brown trout will be critical to the program's success. The cost of the various actions and the source of funding should be clearly specific in the EA.

Impacts of the Proposed Action on Socioeconomics

The EA significantly understates likely cumulative negative economic impacts of (1) the use of long-term intensive and repeated electrofishing, and (2) the mechanical disruption of brown trout

spawning sites on the quality of the Lee Ferry trout fishery, the welfare of the local community, and the regional economic benefits tied to a quality fishery. The positive economic benefits of the incentivized harvest program will only be realized if the reward value for harvesting brown trout is sufficient to attract angler participation and if the program includes an aggressive public relations and marketing effort to encourage angler and community support. Based on the lack of specificity included in the EA it's unclear whether either of these elements will be included in the incentivized harvest program.

Thank you.

John Jordan, John Hamill, Jim Strogen, and Bill Persons
Trout Unlimited and Fly Fishers International GCDAMP Recreational Fishing Representatives

Attachment 1. Specific changes to the EA text
cc Secretary, Department of Interior Secretary's Designee, GCD AMP Superintendent, Grand Canyon National Park Superintendent, Glen Canyon National Recreation Area Regional Director, Upper Colorado River Region, Bureau of Reclamation Director, Arizona Game and Fish Department Senator Jeff Flake Senator John Kyle Congressman Tom O'Halloran Congressman Paul Gosar

Attachment 1. Specific comments and recommended changes to the text of the Expanded Non-Native Aquatic Species Management Plan EA September 2018

p. 4, 5 "Monitoring also occurs below Lava Falls to Pearce Ferry for small-bodied fish" and rest of paragraph on page 5 could be deleted or moved to Appendix G which describes other monitoring efforts by GCMRC, FWS, AGFD, and others.

p. 7 para. 2 "The Proposed Action includes monitoring activities to detect new non-native species, determine if triggers are reached, determine the effectiveness of control actions, and determine if adverse effects to other resources occur that may require off-ramps or adaptions (see Appendix G)".

There should be a better description of specific methods used to determine if triggers are reached, evaluate the effectiveness of control actions, and determine if adverse effects to other resources. Appendix G should be expanded to provide more specificity. If specific research questions are posed, how will they be coordinated with ongoing AMWG research and monitoring?

p. 8 para 2 "If considered necessary, surveys would be conducted for important resources prior to initiation of the action".

Change to: "Scientifically sound, peer reviewed surveys will be conducted for important resources prior to initiation of any action".

p. 8 para 6 Mitigation: "Mechanical disruption of early life stage habitats may require regrading of habitats to restore original contours".

This statement is troubling because it suggests extensive disruption of gravels, not the targeted red disturbance identified in the document. This reference to mitigation should be deleted, or the methods and intent should be clarified.

p. 8 Section 2.2.2.1 Targeted Harvest Control

"Incentivized harvest would be used only in the Glen Canyon reach".

Technically this would remove part of the walk-in fishery downstream of the Paria River, and any angling at Badger Rapid. Suggest you consider removing this geographic limitation, or perhaps expand it to Badger Rapid and perhaps to include Bright Angel Creek. TABLE 2-1

H1 (Incentivized harvest) Will the public and the scientific community be provided the opportunity to comment on specific design of the program? In
order to be a successful program, we believe a substantial effort will be required. Who will lead this effort? M1 (Mechanical disruption). Will the public and the scientific community be provided the opportunity to comment on specific design of this program. Specifically, how will the success of this program be evaluated? p. 9 M1 (Mechanical disruption). Trigger for initiation of this activity (5,000 adults) is at odds with the initiation trigger for the next tier, Mechanical Removal. Can you clarify why M1 (tier 2) would be initiated at 5,000 adults, but M2 (tier 3) would be discontinued at 10,000 adults. How precise are estimates of brown trout population sizes? Will 5,000 be the lower or upper bounds of any confidence limits or uncertainty bounds for population estimates. Is there a study plan in place through GCMRC and the AMWG to estimate population sizes?

M2 (Mechanical Removal). Will this program be evaluated in terms of providing benefit to the native fish community? It will likely be a very expensive undertaking, as was the previous rainbow trout removal program in Grand Canyon National Park. p. 10 M2 (Mechanical Removal). There is an assumption that 5,000 adult brown trout in the Glen Canyon reach will be an important contributor to the number of adults in the Little Colorado River reach. Please clarify this assumption and support with citations.

p. 10 B1 (Introduction of YY male brown trout). "If wild brown trout adults in the Glen Canyon reach decrease to below measurable levels for 3 years, then YY-male introduction would cease unless the population increases to above 500 adults".

Should the off-ramp of "number of brown trout adults decrease to below measurable levels" be included with other actions? More specificity regarding methods of resolving uncertainties (confidence intervals) of population estimates that might trigger actions would be very helpful. We have the general sense that "models" will be used, but think more detail is needed.

p. 11 P1 Keeping green sunfish out of the upper slough at RM -12 may be almost impossible if they are colonizing from upstream. Please clarify the amount of time that removal actions will be attempted and be more specific about the scale of the effort anticipated.

p. 20 ftnote c "Tier 1 tools focus on non-lethal and beneficial use methods of controlling or reducing harmful non-natives, result in little alteration of habitat, and are generally lower cost".

Tier 1 Incentivized harvest is a lethal method, and there should be sufficiently funded to be effective in attracting enough anglers to adversely impact adult brown trout numbers. See earlier comments on adequate "rewards". Given the opposition to mechanical removal from the angling and Native American communities we believe it is appropriate to spend as much on this program as would be spent on Tier 3 activities.

p. 20 ftnote e "If action (use of piscicides) is not effective when implemented over a 5-year period, NPS would pursue additional planning and compliance for any subsequent actions not included within this EA".

Suggest change this to "NPS will conduct additional planning and compliance for use of registered piscicides, including obtaining appropriate licenses for use in public waters".

p. 21 Targeted Harvest Control

We would like to help ensure that there is adequate coordination, marketing, and public relations for the Incentivized Harvest program. While we can help with this effort, we think the lead Agency should be NPS, and suggest that dedicated staff be assigned to this program.

p. 23 Mechanical Disruption of Early Life Stage Habitats

Can you provide references or citations where this strategy has been successful in large river systems? Previous attempts to use Glen Canyon Dam releases to disrupt rainbow trout spawning resulted in increased rainbow trout incubation mortality rates from greater fluctuations in flow (2003 and 2004) compared with normal flow fluctuations (2006-2010). Effects of this mortality were apparent in redd excavations but were not seen in hatch date distributions or in the abundance of the age-0 population. We suggest that compensatory survival would also likely be seen with attempts to disrupt brown trout spawning by mechanical disruption of spawning gravels. Is a specific research project associated with this project? If not, is ongoing monitoring sufficient to evaluate success of this program?

Citations on p. 43 reference wading in streams, and disturbance by cattle, both in relatively small streams. It seems prudent to learn more about specific spawning locations of brown trout in the Lees Ferry reach in order to target disruptions.

This citation should be reference in the EA:
https://www.researchgate.net/publication/241735108_Effects_of_Fluctuating_F
lows_and_a_Controlled_Flood_on_Incubation_Success_and_Early_Survival_Rate
s_and_Growth_of_Age0_Rainbow_Trout_in_a_Large_Regulated_River [accessed Oct 05 2018].

p. 23 Mechanical Removal (Action M2)

The Zale (2012) citation is a general citation from the American Fisheries Society Fisheries Techniques publication. Can you provide other citations that support successful reduction of salmonids by mechanical removal in a large river system?

p. 25 Introduction of YY-Male Fish

While enticing as a silver bullet concept to solve non-native fish problems, introduction of YY-Male brown trout in Glen and Grand Canyons does not seem practical at this time.

p. 27 line 32 2.2.3.1 Control of Brown Trout in the Glen Canyon Reach.

Please change "At a minimum, NPS and AGFD would meet every 3 years to review triggers" to "NPS and AGFD will meet annually to review triggers." Also, we saw no mention of NPS collaboration and coordination with other scientists studying the Glen Canyon Reach. It is critical that field activities and fish sampling be coordinated annually with AGFD, GCMRC, BOR, and contractors working in the reach to avoid duplication of effort or collision of study objectives.

Also, please add a sentence such as that on page 28, end of the third paragraph, referencing consultation with AGFD, GCMRC, FWS, Reclamation, Tribes, and relevant stakeholders, through the AMWG and TWG, to achieve consensus when new triggers are implemented, and to report data that fires those triggers.

p. 45 Mechanical Removal (Action M2)
"Even though mortality of rainbow trout would be small, there is a possibility that electrofishing could affect fishing success of rainbow trout anglers by interfering with fishing activities or temporarily reducing fish catchability. It is anticipated that the impact of electrofishing on rainbow trout angling activities would be limited because (1) the proposed sampling period would occur between November 1 and February 28 when angler activity is generally low, (2) electrofishing activities at a particular location would generally only occur for several hours within a day before collection activities moved to other areas, and (3) shocked rainbow trout would be expected to recommence normal activities within a few days. Overall, adverse impacts of electrofishing to remove brown
trout on the population of rainbow trout or the condition of the rainbow trout fishery in Glen Canyon would be small because the effects on rainbow trout population levels and fish behavior would be spatially and temporally limited"
Suggest change the last phrase to "are unknown, but are hoped to be minor. Angler creel surveys designed to collect and analyze use and catch data will be used as part of evaluation of any actions that may affect the rainbow trout fishery".

p. 69 l. 43 Impact of the Proposed Action on Socioeconomics

"even if mechanical removal activities do not alter rainbow trout population levels or catchability, as described in Section 3.3.2.2, there could be negative impacts to the local fishery economy of anglers perceive that fishing opportunities or catch would be affected."

p. 70 l. 1 "Although not expected, there is the potential for the collective or repeated use of some or all of the potential actions of the Proposed Action to harm the Lees Ferry rainbow trout fishery or result in a negative public perception of the fishery. If this occurred, the actions could have adverse impacts on the local economy that relies on the fishery. Regular monitoring, triggers, and off-ramps are expected to detect any such effect and allow for responsive action to prevent adverse impacts. Mitigation actions, implemented in coordination with AZGFD, would also be applied as needed to maintain a high-quality fishery "

41

We the undersigned conservation/sportsmen organizations, fish guides and Marble Canyon businesses are writing to provide comments on the September 2018 Public Draft of the National Park Service's (NPS) Environmental Assessment (EA) for an Expanded Non-native Aquatic Species Management Plan in Grand Canyon National Park and Glen Canyon National Recreation Area below Glen Canyon Dam. Since 1964, with the completion of the Glen Canyon Dam, the Lees Ferry tailwater has hosted a recreational trout fishery that has grown in importance and reputation locally, regionally, nationally, and internationally. This blue-ribbon recreational sport fishery has also become a financial and economic mainstay for the small community of Marble Canyon and Coconino County, supporting fishing guide services, hotels, restaurants, fishing and outdoor recreation equipment and supplies, and visitor services.

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Specific comments and concerns on the EA's follow.

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stewards of the Nation's fish and wildlife species on public lands and waters under the jurisdiction of the Department. Each [DOI agency] must recognize the fundamental roles of the States in fish and wildlife management, especially where States have primary authority and responsibility, foster improved conservation of fish and wildlife, and encourage a good neighbor policy with the States." and "â€¦the States fundamental responsibility for fish and wildlife management includes responsibility for appropriate regulation of public use and enjoyment of fish and wildlife species. The Department recognizes States as the first line authorities for fish and wildlife management and hereby expresses its commitment to defer to the States in this regard except as otherwise required by Federal law."

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Incentivized Harvest Program

We appreciate and support the implementation of an incentivized brown trout removal as an initial first step effort. A general description of the program is incorporated in the EA but details for funding, implementation and operation are not included. Those details and how they are arrived at will determine success or failure. The support and participation of the angling and guiding communities will be an integral part of the outcome. Angler and guide integration and participation during the planning process will contribute to a successful outcome. The financial reward for each harvested brown trout will be determinative in attracting anglers to participate in the program, particularly in consideration of the small brown trout population in Glen Canyon and the difficulty in catching them. We believe the minimum reward should range between $50 and $100 per fish depending on the total number of brown trout being harvested. The total amount of funding for the program should be comparable to the cost of implementing the mechanical removal efforts outlined under tier 3.

The EA proposes "testing" the incentivized harvest program for three winters prior to implementing other brown trout actions in the Glen Canyon reach. Assuming the program is properly funded, planned and marketed, we believe three complete winters would be the minimum time required to evaluate the operation and effectiveness of the Program. However, the EA proposes the unrealistic date of October 31, 2021 for completing three-year test. Assuming FY 2019 will be used for program planning with implementation beginning in December 2019, this date be extended to October 31, 2022.

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Funding

Adequate funding will be a determinative factor in the successful implementation of the actions outlined in the EA. Currently, the EA is unclear on how much the various management actions will cost or how they will be paid for. As noted above, the amount funding to implement the incentivized harvest program including the amount of the reward offered for each harvested brown trout will be critical to the program's success. The cost of the various actions and the source of funding should be clearly specific in the EA.

Impacts of the Proposed Action on Socioeconomics

The EA significantly understates likely cumulative negative economic impacts of (1) the use of long-term intensive and repeated electrofishing, and (2) the mechanical disruption of brown trout spawning sites on the quality of the Lee Ferry trout fishery, the welfare of the local community, and the regional economic benefits tied to a quality fishery. The positive economic benefits of the incentivized harvest program will only be realized if the reward value for harvesting brown trout is sufficient to attract angler participation and if the program includes an aggressive public relations and marketing effort to encourage angler and community support. Based on the lack of specificity included in the EA it's unclear whether either of these elements will be included in the incentivized harvest program.

42

The Southern Nevada Water Authority (SNWA) and Colorado River Commission of Nevada (CRCNV) appreciate the opportunity to review and provide comments on the subject document. SNWA and CRCNV support the proactive approach proposed by the National Park Service (NPS) for management and control of non-native aquatic species that could threaten native and Federally-listed fish in the Colorado River and its tributaries in Grand Canyon National Park and Glen Canyon National Recreation Area below Glen Canyon Dam. Joint comments from SNWA and CRC are provided below.

Population estimates of brown trout (Salmo trutta) as triggers for control actions - Mechanical control triggers, such as mechanical disruption of early life state habitats (Action M1; Tier 1), rely on population estimates of brown trout >350 mm long in the Glen Canyon reach. Given the lack of suitable mark-recapture information, there is low confidence in the validity of these population estimates. While we support the use of numeric triggers, the high uncertainty of these population estimates, make them less useful and perhaps no better than other, less quantitatively

complex measurements. NPS should identify a plan for obtaining a scientifically defensible population estimate or identify other, more reliable triggering criteria. Invasive species are known to grow aggressively when first introduced. By waiting for certain triggers to be met, the ability to control the invasive species may be lost.

Prohibiting mechanical control actions until October 31, 2021 - NPS should remove this prohibition and immediately allow mechanical controls to be implemented when triggered. We surmise that the intention of this prohibition is to allow time to implement and evaluate if targeted harvest control actions are successful and to generally delay more controversial techniques. While this approach might appear balanced, it is not. It disregards decades of observations that demonstrate how quickly invasive species spread and the importance of robust, early intervention. Moreover, it overly relies on an assumption of harvest control success.

Herbicide use - The ability to use herbicides is limited to a five-year period. This limitation may not be appropriate because there may not be a way to engineer a solution to invasive aquatic plants. NPS should acknowledge and allow for the application of herbicides every year to control the population if it is necessary.

Permitting through the U.S. Army Corps of Engineers - The EA acknowledges that Clean Water Act permits may be required. NPS should consider that Rivers and Harbors Act permits may also be required.

Status of the southwestern willow flycatcher (Empidonax traillii extimus) in Grand Canyon National Park (GCNP) - NPS incorrectly states in the EA that the southwestern willow flycatcher "occurs throughout GCNP" (see page 54). The source of information for this statement is a report entitled Surveying for Southwestern Willow Flycatchers in Grand Canyon National Park, 2010-2012 by Stroud-Settles et al. Their report incorrectly labeled willow flycatchers as the southwestern subspecies. NPS should modify the statement to say that "the willow flycatcher occurs throughout GCNP".

Evidence of brown trout reproduction in Glen Canyon - The description of the trigger to initiate the mechanical disruption of early life stage habitats found in Appendix C includes an extra criterion - that there is evidence that reproduction in Glen Canyon is contributing to the continued increase - not included in Table 2-1. NPS should resolve this discrepancy.

43

The Upper Colorado River Commission (UCRC) hereby submits comments on the National Park Service's (NPS') September 2018 Environmental Assessment of the Expanded Non-Native Aquatic Species Management Plan in Glen Canyon National Recreational Area and Grand Canyon National Park below Glen Canyon Dam (EA). The UCRC is a Cooperating Agency in this National Environmental Policy Act (NEPA) process. The UCRC previously submitted comments through this EA process on November 6, 2017; December 26, 2017; May 25, 2018; and August 10, 2018. The UCRC appreciates the extensive effort of the NPS on this EA, as well as its consideration and incorporation of the UCRC's comments and suggestions, including the specific edits proposed by the UCRC in its August 10, 2018, letter. The UCRC values the opportunity to comment on the EA.

The UCRC's specific comments on the EA concern: (1) references to pre-dam conditions; and (2) language within the section on the "Affected Environment and Environmental Consequences."

1. References to pre-dam conditions

In several instances, the EA refers to conditions that existed prior to construction of Glen Canyon Dam and the effects of the construction of the dam on those conditions (See Endnote 1). Pre-dam conditions should not be used as a baseline against which proposed alternatives are compared. Rather, the appropriate baseline is the No-Action Alternative, which consists of existing operational directives relating to Glen Canyon Dam, including the Long Term Experimental and Management Plan (LTEMP). References to and comparisons with pre-dam conditions are potentially misleading and, if included, are more properly framed as contextual information only. The UCRC requests the following language from Chapter 3 of the LTEMP Environmental Impact Statement (EIS) be added to Section 2 of the EA:

Pre-dam conditions are discussed throughout this EA to provide historical context on certain resources that exist in an already altered environment; however, such references are not intended to form the basis for comparison of the alternatives in this Environmental Assessment, or to provide goals for achieving resource conditions. The action alternatives are compared to the No Action Alternative, as is the standard practice for National Environmental Policy Act of 1969 as amended (NEPA) compliance.

2. Affected Environment and Environmental Consequences

The EA includes an analysis of the affected environment and environmental consequences of the Proposed Action and the No-Action Alternative. Much of this language has been adapted from the LTEMP and provides adequate background on the proposed action. Two sections, however, contain inaccurate or overly broad statements that the UCRC therefore requests NPS to revise.

Water Quality
The description of both the proposed action and the no-action alternative in Sections 3.2.2.1 and 3.2.2.2 characterizes cumulative impacts on water quality as significant and adverse. The UCRC notes that some of the language used in this section was taken from the LTEMP EIS Chapter 3 in a passage about Lake Mead, which is outside of the defined project area of the proposed action. Other language is both new and unsubstantiated, including a claim that salinity has increased in the Colorado River. This is not the understanding of the UCRC and is indeed counter to the information included in the LTEMP EIS. The UCRC notes that a number of factors can affect water temperature and quality, though a complete listing of such factors and their relative impacts is outside the scope of this EA. Accordingly, the UCRC requests that the language in these sections be removed from the EA.

The UCRC also notes that the first row Table B-1 is labelled as "Water Resources" and appears to use language from the LTEMP EIS. While the UCRC appreciates that this language is consistent with the LTEMP, the UCRC notes that Water Resources was not a subject addressed

in this EA; rather, "Water Quality" was the resource considered here. The table should be updated to accurately reflect the resource considered in the EA and to avoid adding a new category of analysis to this document without discussion in the body of the EA.

Aquatic Resources
The EA states in Section 3.3.2.1 that "[s]ignificant, mostly adverse impacts on aquatic resources in the project area primarily result from changes in seasonal and annual flow patterns." The UCRC believes this statement is unnecessary and overly broad. Changes to seasonal and annual flows could also be construed to include the consistent releases which are available due to the dam's water storage and operational agreements among the Basin States - the combination of which provides the benefit of flows which continue even in exceptionally dry years. The UCRC requests NPS remove this language and to instead adapt language from the LTEMP EIS Section 3.5 regarding Aquatic Ecology.

As a Cooperating Agency on this EA, the UCRC reserves the right to submit additional comments on the EA and all EA-related documents during this NEPA process. Once again, UCRC appreciates the opportunity to provide comments on the EA, as well as NPS's continuing efforts on the document itself and the process of engaging Cooperating Agencies, states, and stakeholders.

Thank you for your consideration.

Endnote 1: See Sections 3.1, 3.2.1, 3.2.1.2, 3.4.1.1, 3.4.1.2, 3.4.2.2, 3.5.2.5, 3.6.1.1, 3.7.1.2, Table B-1, and Section E.3 in Appendix E.

44
On September 11, 2018, the National Park Service (NPS) released an Environmental Assessment (EA) for an Expanded Non-Native Aquatic Species Management Plan (Plan) in Glen Canyon National Recreation Area (GCNRA) and Grand Canyon National Park (GCNP) below Glen Canyon Dam. The Irrigation & Electrical Districts Association of Arizona (IEDA) appreciates the opportunity to provide comments on the NPS EA.

IEDA is an Arizona non-profit association formed in 1962 to represent the interests of our members with regard to power and water issues and other related issues and to provide an interface for dealing with federal agencies that manage and distribute these resources.

Fourteen of our 25 members and associate members contract with the Western Area Power Administration (Western) for power from the Colorado River Storage Project (CRSP). Such members have, under contract, in excess of 75% of the CRSP power allocated to the Southern Division. IEDA interfaces with Western and with Bureau of Reclamation on issues involving CRSP, including operation of Glen Canyon Dam, on a regular basis. Additionally, many of our other members take power from other federal resources on the river whose capabilities for delivering that power are affected by the operation of Glen Canyon Dam. Thus, our membership has an abiding interest in any actions taken concerning power operations at Glen Canyon Dam. While the NPS EA examines elements of a program that, taken together, are non-operational, the

results of the program may affect significant downstream resources, including the humpback chub currently listed as endangered, and, therefore, implicate future operational decisions.

With this perspective in mind, we offer the following comments on the NPS EA. In doing so, we endorse and incorporate, and will not repeat, the comments of the Colorado River Energy Distributors Association (CREDA), of which we are a member.

Environmental Impact Statement (EIS) vs. Finding of No Significant Impact (FONSI)

Under the National Environmental Policy Act (NEPA), federal agencies are required to prepare impact statements on major federal actions significantly affecting the quality of the human environment. 42 U.S.C. 4332(2)(C). If any 'significant environmental impacts might result from the proposed agency action then an EIS must be prepared before agency action is taken. Grand Canyon Trust v. F.A.A., 290 F.3d 339, 340 (D.C.Cir. 2002) (quoting Sierra Club v. Peterson, 717 F.2d 1409, 1415 (D.C.Cir. 1983). An EIS must be prepared if substantial questions are raised as to whether a project& may cause significant degradation of some human environmental factor. Greenpeace Action v. Franklin, 14 F.3d 1324, 1332 (9th Cir. 1992); Sierra Club v. United States Forest Serv., 843 F.2d 1190, 1193 (9th Cir. 1988).

To trigger NEPAs requirement that an EIS be prepared, a party need not show that significant 1 effects will in fact occur; raising substantial questions whether a project may have a significant effect is sufficient. Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208 (9th Cir. 1998) cert. denied, 527 U.S. 1003, 119 S. Ct. 2337, 144 L.Ed. 235 (1999). Courts have emphasized that it is enough if an agency's action may have a significant effect on the environment. 2 In determining whether a project will have a significant impact on the environment, an agency must consider [w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts. 40 C.F.R. 1508.27(b)(7). If several actions have a cumulative environmental effect, this consequence must be considered in an EIS. League of Wilderness Defenders v. Marquis-Brong, 259 F.Supp.2d 1115, 1124 (2003) quoting Blackwood, 161 F.3d at 1214.

When examining whether a proposed project will have significant impacts on the environment, an agency must evaluate the degree to which the effects on the quality of the human environment are likely to be highly controversial, and the degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks. See 40 C.F.R. 1508.27(b)(4), (b)(5); see also Blackwood, 161 F.3d at 1212. Similarly, there are guidelines for when courts must determine whether the effects on the quality of the human environment are likely to be highly controversial. The Ninth Circuit held that controversial is construed as a substantial dispute about the size, nature or effect of the major federal action, rather than the existence of opposition to a use. Blackwood, 161 F.3d at 1212, citing Greenpeace Action v. Franklin, 14 F.3d 1324, 1335 (9th Cir. 1992); see also Sierra Club v. United States Forest Service, 843 F.2d 1190, 1193 (9th Cir. 1988). As noted above, to prevail on a claim that a federal agency violated its statutory duty to prepare an EIS, a party need only raise substantial questions whether a project may have a significant effect on the environment. The party does not have to show that significant effects will in fact occur. Blackwood, 161 F.3d at 1212, quoting Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1149 (9th Cir. 1998).

Agencies draft an EA to determine whether its project will significantly affect the environment and thereby trigger an EIS.3 If an agency decides not to prepare an EIS, it must supply a convincing statement of reasons to explain why a projects impacts are insignificant. Save the Yaak Comm. v. Block, 840 F. 2d 714, 717 (9th Cir. 1988). The statement of reasons is crucial to determining whether the agency took a 'hard look at the potential environmental impact of a project. Id. If an agency concludes, on the basis of its EA, that the action is not one significantly affecting the quality of the human environment, it may prepare a FONSI and thereby avoid preparation of an EIS. C.F.R. 1501.4(e), 1508.13. The standard for evaluating such a finding is well established:

First, the agency must have accurately identified the relevant environmental concern. Second, once the agency has identified the problem, it must have taken a hard look at the problem in preparing the EA. Third, if a finding of no significant impact is made, the agency must be able to make a convincing case for its finding. Last, if the agency does find an impact of true significance, preparation of an EIS can be avoided only if the agency finds that changes or safeguards in the project sufficiently reduce the impact to a minimum. Sierra Club v. Dept of Transportation, 753 F.2d 120, 127 (D.C.Cir. 1985).

ANALYSIS

The EA states that the agency is concerned with recent increases in green sunfish and brown trout in the Glen Canyon Reach. The EA admits that these fish pose a risk to endangered fish in downstream areas. The EA is clear that the Plan is action that goes beyond what is available under the 2013 NPS Comprehensive Fish Management Plan (CFMP) and the 2016 Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP).

The press release for the draft EA clearly spells out the intent of the Plan to use additional tools and new approaches to control populations of invasive fish species because of their predation impacts, especially on the listed humpback chub. The EA readily admits that the agency does not know why these invasive populations have appeared. Thus, the Plan cannot be characterized as mitigation because it has no action as a frame of reference. 40 C.F.R. 1508.20. Therefore, these efforts are not related to a project, i.e., the LTEMP ROD. Preservation Coalition, Inc. v. Pierce, 667 F.2d 851 (9th Cir. 1982). They stand alone.

Thus, the Plan analyzed in the EA is a major federal action that requires at least a supplemental EIS, rather than a FONSI.

Moreover, in light of the fact that this Plan would be utilized in combination with the CFMP and LTEMP, the NPS must include a real cumulative effects analysis in this EA, Kern v. U.S. Bureau of Land Management, 284 F.3d 1062 (9th Cir. 2002), not just a chart, especially where no comprehensive monitoring program accompanies this three-hat effort going forward. A true cumulative effects analysis will also support doing an EIS.

CONCLUSION

This proposed action is clearly a major federal action that may significantly affect the quality of the human environment, thus requiring an EIS under NEPA. Thank you for the opportunity to comment on this very important matter.

1 Significance is a function of both the context and intensity of the proposed action. 40 C.F.R. 1508.27. In considering the context of an action, an agency is to address its impact upon society as a whole (human, national), the affected region, the affected interests, and the locality. Id.
2 E.g., Ocean Advocates v. U.S. Army Corps of Engineers, 402 F.3d 846 (9th Cir. 2005); Save Our Ten Acres v. Kreger, 472 F.2d 463 (5th Cir. 1973) (If the court finds that the project may cause a significant degradation of some human environmental factor (even though other environmental factors are affected beneficially or not at all), the court should require the filing of an impact statement.)
3 40 C.F.R. 1508.9.

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I have been a resident of Arizona since 1964 and am currently 64 years old. I have fished the Colorado River above Lee's Ferry since the 1980s. This stretch of the river is amazingly beautiful, very unique and I love it.

I have many serious concerns re: the Environmental Assessment for an Expanded Non-native Aquatic Species Management Plan Below Glen Canyon Dam. I will list only a few of my concerns in this comment. I am adamantly opposed to the Plan as it currently exists.

1. Consultation with the Arizona Game and Fish Department at a minimum of every three years, as proposed, is NOT effective cooperation and coordination. There MUST be reference in the EA to ongoing consultation and cooperation in managing joint jurisdiction areas.
2. I urge you to remove the reference to 5,000 adult brown trout as a trigger and instead maintain the 20,000 trigger with the 10,000 off-ramp.
3. The mechanical removal action proposed for brown trout will undoubtedly cause mortality to rainbow trout. This will negatively alter the fishing success of anglers and impact the local economy during the action; and quite possibly long-term.
4. To claim that there will be little to no impact on fishing satisfaction or the resultant impact on the local economy due to mechanical disruption of redds and mechanical removal of brown trout is not realistic. Further research into the real economic impact of these two actions is needed and must be included in the EA.
5. I adamantly oppose any use of rotenone, as well as the use of herbicides to backwater and channel areas.
6. The EA fails to address the need to eliminate root causes such as the impact of dam operations as a source of increases in brown trout or the many warm water invasive species that are coming downriver through the Glen Canyon Dam.

Thank you for your consideration of my comments. In closing, let me say that in all the many 100s of hours that I have fished this wonderful river, catching and releasing many 100s of rainbow trout, I have NEVER caught or seen a brown trout.

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The State of Colorado hereby submits comments on the National Park Service's (NPS') September 2018 Environmental Assessment of the Expanded Non-Native Aquatic Species Management Plan in Glen Canyon National Recreational Area and Grand Canyon National Park below Glen Canyon Dam (EA). Colorado values the opportunity to comment and appreciates NPS's work on the EA.

The State of Colorado has participated in the EA process through the Upper Colorado River Commission (UCRC) in its status as a cooperating agency. Accordingly, Colorado endorses and supports all comments submitted by the UCRC throughout the EA process, including through UCRC's letters submitted on the preliminary draft alternatives on November 6, 2017; December 26, 2017; May 25, 2018; and August 10, 2018; as well as comments submitted on the EA on October 11, 2018. Those letters are attached hereto and incorporated by reference. Colorado appreciates the consideration and incorporation of UCRC's comments and suggestions.

In general, Colorado endorses the intent and approach of the EA. The potential for non-native aquatic species such as the brown trout to threaten humpback chub and other native species downstream is a risk that must be properly managed. The EA adds tools to the toolkit in a tiered approach that outlines both triggers and off ramps for management actions. We ask that the high level of state and stakeholder engagement that NPS used for the EA process be continued in the implementation of the EA.

The State of Colorado may have other concerns with specific factual or legal assertions in this EA. However, these assertions do not appear to materially alter the analysis in the EA. In addition, in the course of reviewing the EA in an expedient manner, Colorado did not focus on each and every assertion, and instead, only focused on those issues that rose to a level of significant interest at this time. Colorado's failure to raise concerns with inaccurate factual or legal assertions in these comments, or to correct what it believes to be inaccurate information shall not be construed as an admission with respect to any factual or legal issue, or a waiver of any rights for the purposes of any future legal, administrative or other proceeding.

Thank you for your consideration.

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As president of the Gila Trout Chapter of Trout Unlimited I am writing to communicate suggestions and concerns our some 75 members have about the National Park Service (NPS) Environmental Assessment (EA) for an Expanded Non-native Aquatic Species Management Plan for the Lees Ferry section of the Colorado River. We appreciate the revisions to the plan originally presented to the public in December, 2017. We still have concerns about the current EA that we urge you to consider.

First, we specifically request that all public comments and cooperator's comments submitted on the Draft EA for the Expanded Non-Native Aquatic Species Management Plan as released on September 11, 2018 be made available to the public immediately after the October 11, 2018 closing date. We acknowledge that the comments submitted for the original scoping period were

eventually released per our request, and indeed those proved most helpful. We appreciate that release.

We want to acknowledge the addition of incentivized harvest as the first tier for controlling brown trout in this latest version of the EA. We were curious that although it was in your CFMP, that you did not feature it in the initial EA as a tool to share with anglers concerned about the fate of the rainbow trout fishery at Lees Ferry. Those rather contentious meetings could have been a great time to encourage angler support to help shift the normal catch and release ethic that fly fishermen prefer, to instead shift to catch and keep for brown trout as a way to minimize the potential for the intensive electroshocking that all anglers would oppose.

Your EA currently lacks sufficient detail about this tier. Anglers who fish Lees Ferry regularly would be an ideal source of information for you to utilize as you define the specifics of your incentivized harvest plan. AZGFD has a tremendous amount of angler survey data, and guides have years of experience knowing where to fish and what skill sets anglers possess to successfully target brown trout. Please use all of these resources in your incentivized harvest plan development to maximize that tier's likelihood of success.

We strongly encourage you to provide enough incentive to anglers for this effort. The shift from catch and release to catch and keep will be more palatable with a larger incentive. The cost of renting a boat or hiring a guide for fish that are rarely caught by regular rainbow trout fly fishermen is a gamble that could be prohibitive to most fishermen if the incentive is not high enough. There also needs to be a strong education component to this effort with the angler community and the guides to help us all work with you most effectively to give this tier the greatest opportunity for success.

Our understanding is that specific brown trout redd sites are largely unknown except for one location upriver. It is hard to imagine that the number of adult brown trout that you have estimated came from that one location, yet the bulk of your telemetry data utilizes adult brown trout from that location. We encourage you to expand your use of telemetry to find spawning locations throughout the river and do that soon enough to provide that information to anglers as part of the incentivized harvest tier to target brown trout more effectively.

Related to the identification of spawning redds is the potential significant impact that could result from the implementation of tier 2 or tier 3. The EA does not account sufficiently for the likely negative angler perception of redd destruction and extensive mechanical removal efforts that could last from November 1st through February 28th. We believe that you need to further research the potential harm of these particular actions on angler satisfaction that could have long-term effects on whether anglers choose to come to Lees Ferry and the resultant impact on the local economy. When you merged all control actions in the EA to make the statement that collectively most actions would have minimal impact and last less than a day, that terribly discounted the impact of these two actions.

We understand that a great deal of your concern rests on modeling projections for brown trout numbers and humpback chub numbers extrapolated into the future. Models are more accurate with better information. Again, more extensive telemetry data would inform these models for

total populations and equally importantly, give you information to determine if brown trout are remaining in the reach, moving upstream from locations below the LCR, or moving downstream in numbers that would be of concern to the humpback chub population. Recent increases in humpback chubs in the LCR are very encouraging, but as we understand it, not anticipated to that degree from this same type of modeling. Perhaps under-measured events like HFEs, temperature, turbidity, food sources played a role in this shift. It points to the need for more data before implementing severe actions that could cripple the rainbow trout fishery and the local economy that depends on it.

Lastly, we urge you to strongly consider the September 10, 2018 letter from Secretary Zinke. He was very clear in that letter about his intent to shift the authority in areas such as Lees Ferry where the National Park Service and the AGFD have joint management responsibilities to favor the state's authority. You note throughout the EA that the NPS has final authority to make decisions to shift to tiers based not only on threat, but even concerns not based on science, such as cost. We strongly encourage a greater degree of cooperation on your part similar to what you espoused in your reference to the Master Memorandum of Understanding between the National Park Service and AZGFD. The Lees Ferry Rainbow Trout Fishery is too important to allow for unwarranted actions, that may be merely expedient, in direct conflict with AZGFD management plans and counter to the directive of the Department of the Interior.

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Please accept these scoping comments on the Expanded Non-Native Aquatic Species Management Plan Environmental Assessment on behalf of Sierra Clubs Grand Canyon (Arizona) Chapter.

Sierra Club is a national nonprofit organization with 64 chapters and more than three million members and supporters nationwide, 60,000 of whom are part of the Grand Canyon Chapter. Sierra Clubs mission is to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earths ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments. Sierra Club members have a strong interest in the operation of Glen Canyon Dam and its impacts on the health of the Colorado River and its wildlife. Many of our members recreate in Glen and Grand Canyons and have engaged in various processes over the years to ensure that the priority for Colorado River management is on a healthy native Colorado River Ecosystem (CRE). Our members enjoy hiking, backpacking, fishing, camping, wildlife viewing, rafting, and other activities on and along the Colorado River and its tributaries in Glen and Grand Canyons.

Half of the native fish have disappeared from the Colorado River in Grand Canyon and three more are in serious decline; otters and muskrats have disappeared too (1). We owe future generations a healthy Colorado River and should do what we need to do to restore it. We support the National Park Service (NPS) decision to eradicate non-native aquatic species, but cannot support a continuation of a piecemeal approach that ignores the best available science and the cumulative effects of disparate actions, focusing on treating problematic symptoms instead of taking a holistic approach to restoring the integrity and resilience of the river and its tributaries.

Legal Framework and Background

Every aspect of the CRE in the mainstem of the Colorado River between Glen Canyon Dam and Lake Mead is controlled by the upstream dam. The dam dictates sediment loads, water temperatures, flow fluctuations, and water quality, which combine to determine the quality and abundance of the food base, fish, sandbars and beaches, floodplain vegetation and wildlife, wilderness, and visitor experience. As a result, many native species are unable to thrive in the river corridor and depend on the tributaries for their survival. Non-native aquatic species in the river mainstem and the tributaries tax an ecosystem that is already severely depleted.

As a result of the way the Department of Interior (DOI) has managed the resource for 50 years, the ecological integrity of the CRE continues to decline. (2,3,4,5) At least 12, and up to 21, animal species have been extirpated from the Colorado River ecosystem since Glen Canyon Dam closed in 1963 (6), and riparian habitats are now dominated by non-native plant species. The lack of natural flows, the loss of 95% of the corridors sediment and nutrient base, decrease in dissolved oxygen, and the dramatically reduced steady water temperature have had a devastating impact on Grand Canyon's riverine ecosystem (7,8). Changes in all aspects of the natural flood regime threaten the survival of riparian and aquatic species: flow magnitude, frequency, duration, timing, and rate of change across hourly to century scales (9,10).

The effects of this problem were recognized decades ago, leading to an important mandate from Congress to mend the river ecosystem:

The Secretary shall operate Glen Canyon Dam& in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use. (Grand Canyon Protection Act (GCPA) (1992), Section 1802(a))

The Secretary of the Department of Interior and the National Park Service (NPS) have the responsibility to conserve the scenery and the natural and historic objects and the wild life therein (National Park Service Organic Act of 1916 (16 U.S.C. Sec. 118f, 39 Stat 535). Further, the Endangered Species Act (Endangered Species Act of 1973 [Public Law 93205, 87 Stat. 884]) requires that:

Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action) is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available. (Sec. 7(2) [16 U.S.C. 1536])

The Redwoods Act of 1978 clarified the NPS mandate to emphasize that recreation should not be allowed to impair park resources:

Congress further reaffirms, declares, and directs that the promotion and regulation of the various areas of the National Park system& shall be consistent with and founded in the purpose established by the first section of the Act of August 25, 1916, to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directed and specifically provided by Congress. (16 U.S.C. 1a1, 6(b), Public Law No. 95250, emphasis added)

Executive Order 13751 (2016) defines non-native species as with respect to a particular ecosystem, an organism, including its seeds, eggs, spores, or other biological material capable of propagating that species, that occurs outside of its natural range and directs relevant agency programs and authorities to:

(i) prevent the introduction, establishment, and spread of invasive species; (ii) detect and respond rapidly to eradicate or control populations of invasive species in a manner that is cost-effective and minimizes human, animal, plant, and environmental health risks; (iii) monitor invasive species populations accurately and reliably; (iv) provide for the restoration of native species, ecosystems, and other assets that have been impacted by invasive species; (v) conduct research on invasive species and develop and apply technologies to prevent their introduction, and provide for environmentally sound methods of eradication and control of invasive species; (vi) promote public education and action on invasive species, their pathways, and ways to address them, with an emphasis on prevention, and early detection and rapid response; (vii) assess and strengthen, as appropriate, policy and regulatory frameworks pertaining to the prevention, eradication, and control of invasive species and address regulatory gaps, inconsistencies, and conflicts; (viii) coordinate with and complement similar efforts of States, territories, federally recognized American Indian tribes, Alaska Native Corporations, Native Hawaiians, local governments, nongovernmental organizations, and the private sector; and (ix) in consultation with the Department of State and with other agencies as appropriate, coordinate with foreign governments to prevent the movement and minimize the impacts of invasive species;
and
(3) refrain from authorizing, funding, or implementing actions that are likely to cause or promote the introduction, establishment, or spread of invasive species in the United States unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Executive Order 13751 does not distinguish between desirable and undesirable non-native species; it applies to all non-native species equally.

NPS Management Policies (2006, Section 4.4.4.2, Removal of Exotic Species Already Present) call for exotic species to be managed - up to and including eradication - if (1) control is prudent and feasible, and (2) the exotic species interferes with natural processes and the perpetuation of

natural features, native species or natural habitats.

Relevant History

The purpose of this action is to provide additional tools beyond what is available under the CFMP and the LTEMP to allow the NPS to prevent, control, minimize, or eradicate potentially harmful non-native aquatic species, and the risk associated with their presence or expansion, in the project area. (11) NPS has engaged in various Colorado River-related planning processes during the past decade, and Sierra Club has participated in several of these processes. Unfortunately, NPS planning has proceeded in a fractured manner that ignores the cumulative and connected impacts of its different actions and plans.

NPS has also consistently ignored the best available science on flow management to restore and protect riverine ecosystems, despite Sierra Clubs repeatedly identifying the scientific research. Unfortunately, NPS now seems to be dealing with the consequences of ignoring this science - yet, by refusing to consider flow management actions, it is resigning to years more without experimenting to see if methods that have worked elsewhere could improve the Colorado River below Glen Canyon Dam. These future years of inaction could cause more damage to the CRE, and some of it could be irreversible.

During our previous engagement in Colorado River planning processes, we have repeatedly encouraged NPS to holistically address the health of the river, creating a resilient CRE, and asked that NPS design High Flow Experiments (HFEs) and other types of flow experiments to mimic a historic hydrograph to the greatest extent possible. In the 2006 Colorado River Management Plan, NPS chose to focus exclusively on visitor use management, resulting in a missed opportunity to comprehensively identify Colorado River resources at risk, and to identify and prioritize future actions to protect and restore the CRE. In 2011 and 2012, NPS simultaneously developed the High Flow Experiment (HFE) Protocol and Non-native Fish Control Environmental Assessments. Again, in our comments on these two EAs, Sierra Club advocated for a holistic treatment of the river, arguing that the HFE could impact the success of non-native fish control:

While non-native fish control may not depend on the HFE DEA, the HFE DEA proposes an action that can cause harm if not simultaneous with non-native fish control.

The DEA goes on to say, Reclamation does address the cumulative effects from both actions in the affected environmental section of each EA&. Reclamation has not concluded that the actions have 'cumulatively significant impacts. We disagree. If an HFE increases non-native fish populations and non-native fish control efforts dont proceed in a timely manner following the HFE, endangered native fish will be harmed. Even Reclamation admits to this in the HFE DEA: the actions proposed in these EAs may affect each other (HFE DEA, p. 12). (12)
and:
Floods affect fish populations. If, for example, an HFE increases non-native fish populations and non-native fish control efforts don’t proceed in a timely manner following the HFE, endangered native fish can be harmed. Even Reclamation admits to this: the actions proposed in these EAs

may affect each other (HFE DEA, p. 12). Also, why would the DEA discuss changes in bag limits for trout below Glen Canyon Dam under ongoing activities that may influence, relate to, or affect the proposed action if non-native fish control is not connected, cumulative, similar, or causing cumulatively significant impacts (HFE DEA, pp. 12, 14)? Reclamation acknowledges the following:

First, the trout control efforts may involve flow-based actions. Any flow-based action will need to be analyzed to determine if it will affect sediment transport as assessed in this EA. Second, HFEs that could result from this HFE [National Environmental Policy Act (NEPA)] process have the possibility to increase trout numbers. Any needed measures to manage increases in trout numbers will be conducted through the nonnative fish EA. As each EA proceeds, the pertinent analyses will draw from one another. (HFE DEA, p. 23) (13)

In these ways, we encouraged NPS to create one plan to look at flow management together with native and non-native species management. NPS has refused, pulling apart the Colorado River to separately manage the water, sediment, recreation, and biological resources.

Later, in Sierra Clubs LTEMP comments, we advocated for the health of the CRE to be prioritized above all else, insisting that LTEMP must aim to restore the full suite of species in the Colorado River in Grand Canyon that existed before construction of Glen Canyon Dam. (14) Instead of applying best available science to actually improve the CRE, NPS and the Bureau of Reclamation (BOR) chose to develop a plan that would merely minimize-consistent with law-adverse impacts on the downstream natural, recreational, and cultural resources. (15)

In all these cases, we asked that NPS design flow experiments to mimic a historic hydrograph to the greatest extent possible. When commenting on the Draft Environmental Assessment for Non-Native Fish Control Downstream from Glen Canyon Dam, we asked that the EIS might better satisfy the need to fulfill biological objectives [via] alternative flow regimes that more closely mimic the historic Colorado River hydrograph. (16)

In our comments on the Draft Environmental Assessment (DEA) for the Development and Implementation of a Protocol for High-Flow Experimental Releases from Glen Canyon Dam, Arizona, 2011 through 2020, we offered several suggestions for ways that NPS could create an ecological flow regime to benefit the CRE, including:

Timing flows to accommodate one or more native species often benefits a suite of natives, as was seen on the Truckee River, where flows promoting native fish restored native vegetation (Rood et al. 2003). A similar phenomenon can be observed along the San Juan River, where flows to promote native fish have encouraged dense willow recruitment along banks. &
November floods are not part of the natural hydrograph of the Colorado River&
A loss of food base at Lees Ferry is considered to be a potential negative effect of a fall HFE&
The largest magnitude and duration HFEs are shown to be most effective. This indicates that flows larger than the 4-day HFEs proposed here would be even better at conserving the resources of Grand Canyon National Park&

Basing flood timing on rapid response to the Paria alone may lead to a Colorado River hydrology that benefits sandbars but harms native organisms. Many desert organisms respond to triggers that cue them to escape or find shelter before floods (Lytle and White 2007). Others, such as seed-bearing plants, may rely on properly timed floods for reproduction. Relying solely on sediment inputs from a stream with hydrology that deviates from the natural Colorado River hydrograph may do more harm than good. (17)

Our LTEMP comments focused largely on expanding the ecological flow model, and we asked DOI to consider an alternative based on a historical hydrograph. DOI neglected to consider our scoping comments on LTEMP and the alternative proposal was ignored:

LTEMP must attempt to improve habitats, as has been managed on other dammed rivers in the Southwest. (18,19,20,21) Instead of starting from scratch or beginning with power consumption trends, DOI can begin by attempting to recreate the shape of the historic hydrograph determined by Topping et al. (22). Historically, while flow varied from year to year, water levels generally increased until June, followed by a gradual ramp down to a lower level between September and February. (23) Not only will this mimic the historic hydrograph, it could help support algae production in this food-base challenged river (24). Sometimes the historic flow would spike again in response to late summer monsoons, but that peak was generally lower than the summer peak, and happened more infrequently. (25) Large daily fluctuations almost never historically occurred and the dramatic flow step-downs and step-ups in the typical post-Glen Canyon Dam hydrograph were nonexistent. (26)

DOI must look at the components of the hydrograph and analyze each component for its ecological effects. In other words, think about the species that need protection and restoration and determine what flow manipulations would benefit them. For example, instead of surrendering to losing vegetation under all alternatives, DOI should employ the well-established science of maintaining ecological flows and managing dams for aquatic and floodplain resources. (27,28,29,30,31) &

We propose a historically based hydrograph alternative that attempts to restore hydrological functions instead of just taking pieces of the historic hydrograph out of context. In particular, we understand that no experimental flows have been considered for vegetation objectives. The following guidelines should benefit vegetation and other riparian and aquatic resources if attention is placed on flow magnitude, frequency, duration, timing, and rate of change. (32,33)

The hydrograph should aim for a similar shape (though at a smaller scale) to Figure 23 in Topping et al. 2003. (34)...

The HFEs should spread the high flows across several days and spring/summer HFEs should ramp down slowly, according to the recruitment box model. (35) (36)

Now, just a year after NPS and BOR locked themselves into a dam management plan that ignored the science on ecological flow regimes, NPS is assessing a suite of management actions to work in a patchwork manner to fix symptoms that are likely caused by poor flow management choices - and once again NPS refuses to even consider operating the dam for a different flow

regime.

NPS must consider flow alterations as part of this plan

NPS prepared a whitepaper on the brown trout situation below Glen Canyon Dam; Brown Trout below Glen Canyon Dam: A Preliminary Analysis of Risks and Options was preliminarily made available as a Final Pre-Workshop Version dated September 21, 2017. (37) Out of seven possible hypotheses for brown trout increases, The fall HFE hypothesis (H1) ranked consistently high in each of the four weighting exercises (eight of a possible ten 1st place ranks), and this hypothesis also had the largest weight& the fall HFE hypothesis was more than double the next closest hypotheses& only one hypothesis - fall HFEs- was weighted considerably higher than all others. (38)

From the preliminary whitepaper:

The timing of HFEs is potentially an effective tool for the management of brown trout populations. Brown trout populations have been shown to be sensitive to hydrology, with extremes in discharge (both floods and droughts) often inhibiting recruitment, even to the point of population collapses (Lob n-Cervi , 2009). This vulnerability of recruiting classes is short in duration, and is restricted to the period immediately prior to and surrounding emergence, when young fish are searching out territories and feeding positions (Cattan o and others, 2002; Cattan o and others, 2003; Lob n-Cervi , 2009). Conversely, age-1 and older cohorts are resistant to high-mortality associated with floods (Jensen and Johnsen, 1999). Such is the influence of hydrology on early life-stages that the ability of both rainbow trout (Fausch and others, 2001) and brown trout (Wood and Budy, 2009) to successfully invade and persist in streams is correlated with a low probability of floods overlapping with emergence, a period bounded for each species by differential spawning seasonality and water temperature during incubation. An increase in winter floods projected with warmer, rainier winters in a changing climate may specifically disadvantage brown trout in certain systems where they are presently successful (Wenger and others, 2011). It is hypothesized that fall-timed HFEs cleanse spawning gravels immediately prior to brown trout spawning thereby improving egg survival and recruitment. Fall-timed HFEs may cue migration of ripe brown trout into Glen Canyon thereby augmenting the number of spawners. Suspending or moving HFEs to spring would alter these seasonal outcomes, possibly disadvantaging brown trout and favoring rainbow trout. It is also a potential that spring HFEs could leave emerging brown trout vulnerable to predation and other threats. (39)

Spring HFEs may also disadvantage brown trout and favor rainbow trout through shifts in the food base. For example, the 2008 spring HFE reduced the abundance of scuds (Gammarus lacustris) (Cross and others, 2011), an aquatic amphipod that may promote growth and survival of brown trout. (40)

Annual spring HFEs are potentially an effective tool for the management of brown trout populations. (41)

In other words, not only are fall HFEs potentially contributing to the problem, spring HFEs might be a solution.

The final peer-reviewed version of that paper did not assign quantitative weights of evidence to the proposed hypotheses; instead it chose certain hypotheses to carry forward, including hypotheses related to fall HFEs. (42)

Trout Management Flows (TMFs) might target brown trout, but their timing also needs to be changed to target young-of-year in nearshore habitats in February through April. (43) This is not the same timing that was planned in LTEMP for rainbow trout control, but LTEMP allows flexibility in timing TMFs and NPS should experiment with TMFs during the February through April timeframe. The EA actually discounts the potential for use of TMFs because of the potential impact to associated tribes TCPs and potential effects on visitors, including boaters and anglers. (EA at p.63 and 66)

Flow modifications would be a more efficient and productive use of resources, with a more far reaching impact on the problem than the isolated mechanical or chemical controls that are proposed in this plan. Scientific research, experimentation in other river systems, and the expert scientific opinion presented in the brown trout whitepaper all agree that flow modifications provide the best potential solution on the largest scale. (44) Complementing flow modifications, smaller scale experiments could be used such as mechanical control of mature brown trout, chemical control in confined areas, etc., but only flow modifications can treat the entire river corridor.

Whatever needs to be done should be done to amend LTEMP so that it actually meets its objectives, before more damage to the CRE occurs. In lieu of amending LTEMP, NPS could work with the Bureau of Reclamation to incorporate flow modifications into NNAS. Fall high flows are likely exacerbating the brown trout problem, and NPS is missing an important opportunity to bring the CRE back into a healthy state by deferring spring HFEs until 2020 to comply with the flawed LTEMP; even after 2020, the triggering conditions that would allow spring HFEs make their probability pretty low. (45)

Above all, a healthy, resilient CRE should be top priority, and all efforts should be made to manage the river for its native ecosystem.

Brown trout pose a threat to native fish and should be managed appropriately

Non-native trout predation poses one of the greatest dangers to native fish such as humpback chub. (46) Brown trout diets are more dependent on piscivory than rainbow trout, and they are more tolerant to higher temperatures and foraging in low light conditions, making them an increased threat on endangered species that thrive in tributary streams. (47,48, 49) Therefore, controlling brown and rainbow trout in the Colorado River through Grand Canyon is an integral part of the 2002 Humpback Chub Recovery Goals. (50)

Time Limitations and Triggers for Brown Trout Control Must be Lowered
Under this EA, brown trout control would begin with incentivized harvest for a minimum of three years, and no other actions would become available until October 31, 2021. (EA at p.27) Even after that date, the goal would only be to remove 25% to 50% of adult brown trout

(>350mm) and some juveniles from the population each year. (EA at p.27) This is preposterous and sets up NPS for the eventual inability to control the population of brown trout in the Glen Canyon reach. The trigger for Tier 2 and 3 actions, mechanical disruption of early life stage habitats and mechanical removal, would be unavailable for three years despite the fact that trigger of 5,000 adults in the Glen Canyon reach has already been met (EA at p.9 and 51). If populations continue to increase at the rate they have for the past 3-4 years, they will become unmanageable before another 3 years are through. The goals should be to remove more than 75% of brown trout to protect other resources. Instead, incentivized harvest (Tier 1) should be conducted concurrently with other brown trout control actions.

Reach-wide Electrofishing Should be Employed Immediately
Reach-wide electrofishing with beneficial use of harvested fish could be implemented immediately and remove all or most brown trout from the Glen Canyon reach. (EA at p. 28) This should be done immediately, in concurrence with incentivized harvest to remove any brown trout that remain.

We are also supportive of electrofishing being conducted in the Glen Canyon reach or close to the boundary of Glen Canyon National Recreation Area and Grand Canyon National Park for three reasons. First, the control method(s) should focus on the location where brown trout are proliferating, and treat the source of the issue. Second, we should not wait for the trout to reach close approximation to an endangered species before we try to remove them. Third, the backcountry of Grand Canyon National Park is a Proposed Wilderness, and backcountry users work extremely hard to seek solitude that should be protected to the greatest extent possible. Lees Ferry is already a developed area with a lot of motorized activity, and people expect NPS and concession activities to be occurring there.

As we suggested in our comments on the Draft Environmental Assessment for Non-Native Fish Control Downstream from Glen Canyon Dam:

Electrofishing upstream of Lees Ferry should also be considered, rather than waiting for fish to emigrate downstream, since electrofishing in Glen Canyon National Recreation Area would have less impact on the wilderness values of Grand Canyon National Park, and might be more effective at removing trout. (52)

Use native fish to build resilience into the CRE

Colorado pikeminnow were once a top predator in the Colorado River. These iconic fish can live up to 40 years and grow up to 6 feet long. Colorado pikeminnow once migrated throughout the watershed but have been completely extirpated from Grand Canyon. They have been successfully reintroduced to the Verde River, demonstrating their potential for survival if re-released in Grand Canyon. Native fish co-evolved with the Colorado pikeminnow and have defenses that will allow them to thrive in the presence of this predator.

Grand Canyon National Parks fisheries management goals include Restore self-sustaining populations of extirpated fish species including Colorado pikeminnow. (53) The 2013 Comprehensive Fisheries Management Plan also prioritizes the Colorado pikeminnow for its

own reintroduction feasibility study. (54) The current project should build upon previous goals and work toward creating a resilient CRE by re-introducing the native extirpated Colorado pikeminnow as a non-native fish control.

In the proposed action within Tier 1 of management is the application of a repellent to structures to prevent quagga mussels and Asian clams. The favorable repellent treatment uses hot pepper capsaicin in a wax-based application. It is a deterrent that seems to not cause lasting damage. This type of repellent is not a new invention; it was documented 20 years ago. (55) When repellent is used, most mollusks avoid attaching to structures with the hot pepper wax, but we dont know where the mollusks then attach. The wax does not kill the mollusks, and quagga mussels can survive in fast moving water and live outside of water for up to a week. Will more quagga mussels attach to natural structures within the river? Will they pass more easily through infrastructure that is treated with the repellent? How long does the repellent last and how often would it have to be applied in order to be successful? How costly is the experiment going to be? What is the second tier option to control the quagga mussel expansion and continued invasion if this treatment doesnt work? Are there any other actions that can be taken if quagga mussels are found in Grand Canyon?
On top of that issue more quagga mussels could travel down through the dam and continue through the Colorado River. Is it possible that they will travel in larger numbers down the Colorado after not attaching to structures in the lake? The mussels are already a problem inside the Glen Canyon Dam. Since 2007 quagga mussels have been found in the Colorado River in Arizona. (56)

Turbidity change should be an option for mechanical treatment

The Colorado River was rich in sediment prior to the closure of Glen Canyon Dam, and its tributaries are prone to flash flood events that move large amounts of sediment in episodic events. Native fish are well adapted to these high sediment lodes, and increasing turbidity could disadvantage non-native species. The option of increasing turbidity in isolated locations should be considered.

Shinumo Creek should be targeted for non-native control efforts

Shinumo Creeks topography, with a natural barrier to aquatic species migration, makes it an optimal location for creating a fully native ecosystem. We are supportive of chemical treatments and the restoration of a native suite of species in Shinumo Creek.

Provide Multiple Options for Collection of Harvest Incentives
The use of incentivized harvest is a great way to remove target species while also providing educational and recreational opportunities. However, there should be multiple options to turn in fish heads. The Navajo Bridge Visitor Center closes between 4 and 6pm and is closed on some holidays. Consider working with local lodges and markets so that people who don’t get off the water in time to make it to the Visitor Center can also collect their incentives. This could also help local businesses increase walk-in traffic.

NPS Should Not Relocate Green Sunfish Above Glen Canyon Dam

It is unclear why NPS would relocate green sunfish above the dam when they keep passing through the dam and recolonizing the -12 Mile Slough. (EA at p.24) NPS should not consider this action.

Thank you for considering our input on the Expanded Non-Native Aquatic Species Management Plan Environmental Assessment. We hope you will prioritize the protection of a healthy resilient natural ecosystem above all other concerns when creating this plan.
Please keep us informed of the status of this project and contact us with any questions you may have about our comments. Thank you.

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Thank you again for your time at the Phoenix public scoping meeting last month. We certainly appreciated your time and the NPS representatives time in making these public meetings possible. In addition, we appreciate the much more moderate approach of an incentivized harvest, versus the scorched earth approach earlier proposed.

After the public meeting, and our opportunity to review the Expanded Non-Native Aquatic Species Management Plan further, we found some areas of concern. Among our concerns are:

" What is probability and likelihood that a significant population of ~5000-brown trout 1.4-percent of Trout population will leave the cold-water of the Lees Ferry reach and migrate 50 miles to the predominant humpback chub waters? In other words, Is the probability of a massive humpback chub piscocide by the Lees Ferry brown trout significant enough to warrant the extensive time, money, and resources expended by the proposed Expanded Non-Native Aquatic Species Management Plan?
" A seeming lack of clarity on funding sources, or specific steps ensuring the plans effectiveness. Obviously, we all want the plan to work; however, without specific action steps, and the necessary funding your extensive Expanded Non-Native Aquatic Species Management Plan becomes little more than an academic paper.
" Additionally, we'd like you provide more detail on the scope and scale of the brown trout spawning area disruption and the impact this spawning bed disruption will have on rainbow trout should the Tier 2 progression become necessary.
" We remain concerned about the Tier 3 "mechanical harvest." We are particularly concerned about repeated rainbow trout electroshocking and the collateral damage to the rainbows a 40-day electroshocking, may yield.
" We are not opposed to an incentivized harvest plan, and we believe, like you, this could have positive impact on the local economy. However, mechanical removal could have significant negative impact on this fragile guiding/lodging and native community.
" Finally, we are concerned the NPS reserves the right to take any actions they deem necessary without further consultation with Arizona Game and Fish Department, the Tribes, and the angling community. We advocate for a commitment to collaboration.

We appreciate the opportunity to comment, and sincerely hope you will consider our comments.

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I appreciate the opportunity to weigh in on the EA regarding management of non-native aquatic species. Though I am no expert in the management of native aquatic species, I do have some concerns with the current management plan in a stretch of the CO river that has already been significantly altered due to the installment of the Glen Canyon Dam. I agree with the importance of keeping wild places wild, and our responsibility to minimize impact to the habitat and species that have inhabited these places throughout history, but also acknowledge (for better for worse), that we've already significantly altered a habitat beyond the ideal living conditions for

historically native species. Given my lack of expertise, and love for fishing the stretch of water between Lee's Ferry and the dam, my concerns are aligned with those promoted by Lee's Ferry Anglers, a group who has significant experience in tailwater fisheries - many of which are inhabited by Rainbow and Brown trout. My concerns are as follows:

1. The EA states that NPS retains all authority over decisions related to brown trout and other non-native fish management actions. These statements are inconsistent with Secretary Zinke's September 10, 2018 letter on State Fish and Wildlife Management on DOI Lands and Water and the 2013 Master Memorandum of Understanding between NPS and the Arizona Game and Fish Commission. Rather, the EA should indicate that all NPS actions related to the Lee Ferry Trout fishery will be coordinated and approved with the AZGFD.

2. The economic impacts of full implementation of all the management actions related to brown trout management are under-stated in the EA. Despite the various reservoir fisheries in Arizona, and meager quantities of stream fisheries, Lee's Ferry is known world-wide as a scenic, and productive trout fishery that draws anglers from around the US, and what I presume to be international guests. Marble Canyon is not a home to industry, or significant employment opportunity, and it seems risky to gamble the productivity of the fishery in favor of doing our best to salvage native species whose habitat has already been significantly altered. I we really wanted to protect the native species... perhaps consideration of the dam would be more effective - though I know this is is nearly impossible given the arid west's dependence on power generated by the dam. I would like to further understand how the figures representing the decrease were estimated, and what contingency plan would be in place for those dependent on the fishery if it were to decline (again).

3. More detail needs to be provided on the scope and scale of the project to mechanically disrupt brown trout spawning redds and the resultant impact to the rainbow trout fishery. I haven't read the "50 Best Tailwater Fisheries" book, but do know from experience in fishing the Navajo Damn that Rainbow Trout and Brown Trout can live in harmony. It is understood that the brown trout are more predacious with respect to Rainbow Trout and other fish species (natives), but how effective is that in a stretch of water that is already inhabitable to the species that we're trying to protect? By disrupting the brown trout spawning areas, how can we be sure that we haven't also disrupted the Rainbow spawning areas?

4. NPS plans for funding the various actions need to be specified in the EA. The EA describes various actions, but for most of them, it states that "Funding is not available." What is the plan for securing this funding?

5. The proposed brown trout incentivized harvest program needs to be more clearly described and funding must be sufficient to attract anglers to participate. I wouldn't require significant funding to be attracted, as participating with fellow anglers and the outdoor community would be sufficient, but I also live in Flagstaff, and don't require significant travel expenses so the bar is low. How would the plan attract those who live in southern AZ, Utah, California, Colorado, and non-bordering states?

Ultimately, I applaud the effort to restore land and those species who inhabit such habitats to

their original state, but I also feel as though this effort is too-little-too late given the infrastructure that is already in place. How successful have past efforts been on this stretch of water, and other analogous river projects been?

Thank you for your consideration,

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I have fished Lees Ferry starting about 30 years ago. This has been an incredible showcase to a unique environment and fishery. The ups and downs over the years have been notable. It is a world class opportunity for Arizonans to have in their own backyard. I haven't been able to fish it much in the last 10 years, but wish to return in retirement and to share it with my grandson.

The rainbows of the old days were quite a catch, big, strong fighting monsters. I would not want to have a plan that further hurt that population. The electroshocking method of reducing browns would put the rainbows at risk.

I am also an avid brown trout fisherman and very much enjoy their unique style. To be able to have a fishery where the culling of browns was the primary management method, would be a unique chance to actually keep some of these beauties. I normally catch and release most of my fish. Brown trout in the fall when they are spawning can yield fish that are not in their prime for taste (as a fall spawning species). In all other seasons, a pink flesh brown is a real treat. I would love to have a place to catch a brown or two and not have to feel guilty about keeping them. Catch and Keep is an effective management technique. If word got out about a quality fishery and information was available about where they were hitting (guides and other fisherman), perhaps the taking of browns could be improved. The canyon is a very big place. I am in favor of the new plan, with perhaps the big emphasis on Tier 1. Maybe helping guides and tours organize focused outings or float trips to fish the length and the feeder streams where they breed.

I hope they can be preserved. I stand ready (or wade/float ready) to do my part to keep a few of these.

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I wanted to submit these individual comments because I have a long involvement in the Lees Ferry Rainbow Trout Fishery and indeed the Glen Canyon Dam Adaptive Management Program. I am a previous member of the GCDAMP Technical Work Group. I was part of the GCDAMP Recreational Fishing Representative Group that developed a comprehensive set of recommendations for management of that fishery that was ultimately adopted by the Arizona Game and Fish Department as the basis of their official management plan for Lees Ferry. I participated with comments on the NPS Comprehensive Fisheries Management Plan EA, and participated in many of the AMWG/TWG reviews of the LTEMP EIS. In addition, I was part of the group that advocated for convening a comprehensive Brown Trout scientific workshop to establish a valid base of information to aid management of that species in the Colorado River.

First I request that all public and cooperator comments submitted on the Draft Expanded Non-native Aquatic Species Management Plan EA be made immediately available to the general

public as allowed under NEPA guidelines. I personally requested and we eventually obtained the comments submitted during the scoping comments period and those proved most helpful to many interested parties. I appreciate those being made available, and request the comments on the Draft EA can be available more promptly.

My specific comments on the contents of the Draft EA released on September 11, 2018 follow;

1) The Draft EA does not appear to comply with the directive letter released by Secretary of the Interior Zinke on September 10, 2018, either in spirit or detail. That directive called for DOI agencies and services to work cooperatively with state departments and agencies dealing with wildlife management on lands and waters under Department agency jurisdiction, and to recognize the authority of those state organizations to deal with wildlife issues. I hope the Record of Decision or equivalent for this EA will rectify that apparent difference, and eliminate those statements about the NPS having "Final Decision Authority". A truly collaborative and cooperative decision making process with the AZGFD will serve the people of Arizona and the general population much better than the limited capabilities of the NPS.

2) The proposed incentivized harvest program for brown trout needs to be much more clearly described and funding must be sufficient to attract anglers to participate. It is clear that this is a potentially powerful approach to management of brown trout populations, but must be properly approached with good data and understanding of brown trout dynamics and locations. This requires more and better organized information than appears to exist currently. It does not appear that sufficient monitoring, or sufficient planning for funding this approach has been established. Both these issues need to be addressed with more clarity and information.

3) From my perspective and with full awareness of the enormous complexities and extensive trade-offs necessary for the management of any resource on the Colorado River, it appears the actual economic impacts of full implementation of all the management actions related to brown trout management are under-stated in the EA. Insufficient justification of these estimates is provided.

4) The EA lacks sufficient detail on potential plans, tiering triggers, potential scope, scale and locations of the potential efforts to mechanically disrupt brown trout spawning redds and the resultant impact to the rainbow trout fishery. How can the full potential impact of these possible actions on the ecosystems and on the Rainbow Trout Fishery be estimated with this cursory review?

5) It is abundantly clear that NPS plans for selection and execution of the various actions, the extent of those actions, and the triggers and tiers for those actions depend on their cost, the level of funding, the availability of those funds and even the funding mechanisms; all those various issues need to be specified and addressed in the EA, not just in some future and not publicly visible implementation plan.

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The Hopi Tribe appreciates the opportunity to review the Expanded Non-native Aquatic Species Management Plan in Glen Canyon National Recreation Area and Grand Canyon National Park Below Glen Canyon Dam Environmental Assessment and would like to provide the following comments for your consideration. Overall, the document does a good job of addressing an important topic and importantly recognizes and incorporates concerns expressed by the Hopi Tribe during the development of the document.

Foundational to the Hopi Tribe's management view is the recognition that all living entities deserve the right to be treated respectfully, whether they are considered native or non-native (a non-native species in one location is native somewhere else). They all have a life-force which conveys intrinsic value to them and killing them should not be trivialized. Further, because human choices, activities, and behaviors are almost always at the heart of non-native "problems," changing what people are doing first, rather than immediately killing the non-native species should be considered. Where native and non-native species can co-exist, that is the preferred situation. That said there is also a stewardship mandate for Hopis to serve as stewards of the earth and allowing a native species to go extinct when it is preventable is also not appropriate.

A topic that should be better explained in the document is the various, often conflicting management approaches for the rainbow trout. Even though they are a non-native species that is present in the system and arguments have long been made regarding its potential threat to the native species, little background information is provided on why they are largely excluded from any of the management actions detailed in this document. There is reference to the desire to maintain a recreational trout fishery at Lees Ferry, and in other places, the focus on removing non-natives, including rainbow trout, in GCNP. Management actions under L TEMP, CFMP, biological opinions, etc. are cited but not summarized, so it is not evident to the reader how these seek to manage rainbow trout populations or interface with the current proposal. Finally, it is not clear the degree to which rainbow trout (particularly in GCNP and tributaries) could be the target of a number of the describe actions/treatments in this document.

How the terms "aquatic species" or "species" is used needs to be reviewed for consistent use throughout the document, particularly in the "Environmental Consequences" sections. In many cases, the context implies an analysis or action focused specifically on fish, even though the more encompassing term "aquatic species" is used. At other times, the context for the use of "aquatic species" is ambiguous and could be referring to just fish or to all aquatic organisms. Finally, there are instances where "aquatic species" is explicitly used for species other than fish (for instance in the sections evaluating chemical treatments). Which type(s) of aquatic life are being considered in any discussions should be clarified as it is important to understanding all potential collateral impacts to aquatic life, not just the fish.

Some specific comments follow:

Page 3. 151 paragraph (continued from previous page): While brown trout are clearly a potential threat to native species, the way this section is worded, it implies that downstream migration from lees Ferry would introduce brown trout into a new habitat, which isn't the case. Noting that the brown trout in Lees Ferry most likely originated from the downstream Bright Angel Creek

area would help clarify the situation.

Page 4, 1st paragraph (continued from previous page), first numbered item Cl): Recommend changing wording to: mechanical removal of rainbow and brown trout from the mainstem Colorado River near is confluence with the Little Colorado River, with beneficial use of the removed fish;

Page 6. paragraph under 2.2.1 heading, last sentence: For Hopi, all life is important and should not be taken without appropriate respect and acknowledgement of its sacrifice. This applies to both native and non-native species.

Page 6, 2nd full paragraph. 1st sentence: Would the term "intrusive" or "invasive" better reflect the Tier 1 actions rather than "intensive?"

Page 6, last paragraph: There should be a discussion on how tribes will be notified and consulted when the decision is made to move to a higher tier.

Page 7, 2nd bullet under 2.2.2 heading, Physical controls: Suggest that target locations could include critical habitat locations in addition to just source areas.

Page 8, 5th full paragraph. sentence starting "Mitigation could be ... ' : Suggest using the term Rehabilitation rather the "Mitigation" in this situation.

Page 9, Table 2-1: It is not clear what is gained by splitting out the Brown Trout actions from other non-native fish actions for Glen Canyon since most potential actions are the same and further, there is a column that identifies the target species for each action. In addition, do the targeted species ("Any harmful non-native aquatic species") ever include rainbow trout, particularly in GCNP? Finally, it would flow better to move this table to after the descriptions of potential actions.

Page 21. 1st paragraph. 2nd full sentence starting "NPS or partners may provide ... ": What does "approved fishing techniques" mean? Is this related to regulations or is it referring to some other aspect
of fishing?

Page 23. 2.2.2.3 Mechanical Disruption of Early Life Stage Habitats: Suggest that this action should be reclassified as a Physical Control. As currently defined, the focus is on habitat disruption (like the other physical controls), rather than directly targeting the species itself for removal. If this change is made, it will need to be made through all portions of the document where Ml is referenced. An implication of this change is that making a habitat unsuitable for non-natives to become established or flourish may (or may not) be viewed as culturally less negative than directly killing the non-natives.

Page 35, 3rd paragraph under 3.3.1.3: Rainbow trout should be mentioned here as they are such a focus of downstream research and management, including actions required by the biological opinion.

Page 36, 1st partial paragraph under Table 3-l.last sentence: Rainbow trout are not listed in Table F-1.

Page 37, last sentence: Flow operations (including fall HFEs) and/or upstream migration are implied as the only possible reasons for increases in brown trout in the Lees Ferry reach. Clearly migration from downstream was the original source of the increase, but there may be other factors for ongoing increases and persistence in the Lees Ferry reach besides those listed.

Page 38, 2"d full paragraph: The first sentence in this paragraph identifies that there were estimated to be 6,000 adult brown trout in 2017. Further down in the paragraph, a statement is made that modeling indicated that there should be an impact to humpback chub populations at the LCR if adult brown trout populations exceeded 5,000. Has monitoring identified an adverse impact to the humpback chub due to the 6,000 brown trout? Are the model assumptions correct?

Page 39, 40. possibly elsewhere: The term "status quo" is used in a number of contexts where it seems to be used as a synonym for the "No-Action Alternative." Recommend using No-Action Alternative if this is what is meant.

Page 43, 1st paragraph under "Mechanical Disruption' ... heading, 2nd sentence: Not sure how the comparison of disturbance caused by HFEs helps quantify or clarify the disturbance caused by mechanical displacement of spawning gravels. Is there a study that quantifies the changes to these gravel habitats because of HFEs so the comparison can be made?

Page 4 7, 3 rd paragraph under Introduction of YY -Male .. . heading. starting at 2nd sentence: An annual stocking number of 5,000 YY-males is identified generally as a target level for this action and then modeling of the potential impacts on humpback chub is provided. Is this the same modeling as used on Page 38 (see comment above) that identified that 5,000 brown trout would have an adverse impact to the humpback chub at the LCR?

Page 49. 2"d complete paragraph,. last sentence starting "Because treatment would be planned ... ": The assessment of having negligible impacts to the invertebrate community is focused on the longer term effects. In the short term, there would potentially be lethal impacts.

Page 56. 151 two paragraphs: Since this discussion addresses the aquatic stages of the amphibian life cycle; it might be appropriate to reference or duplicate it in the aquatic section of the document. There is a similar situation with the invertebrate community where part of the life cycle may be aquatic and other parts terrestrial.

Page 63. 1st paragraph under 3.5 .2.5 heading. last sentence: High elevation sand deposition from HFEs should be viewed as positive for cultural reasons beyond just making sand available for wind transport.
Simply having a high elevation sand budget that is less negative could be viewed as positive or neutral for archaeological site preservation, no matter the mechanism by which it is achieved and there may be some positive effects related to TCP aspects of the riparian terrestrial ecosystem.

Page 63, 2"d paragraph under 3.5.2.5 heading, last sentence: The riparian vegetations treatments may improve vegetation conditions from a tribal cultural perspective. Also, it is not clear what a "more natural riparian ecosystem" means. Certainly from a tribal perspective, this could be the pre-dam, preEuropean contact ecosystem, which is not what the vegetation treatments will be achieving.

Page 63. 3rd paragraph under 3.5.2.5 heading: This paragraph is redundant with the previous paragraph.

Page 67, 2"d complete sentence on top of page: What is the percentage increase in just administrative
trips in GCNP if treatments are implemented?

54
The Arizona Game and Fish Department (Department) appreciates the opportunity to participate as a Cooperating Agency in the Expanded Non-native Aquatic Species Management Plan in Glen Canyon National Recreation Area and Grand Canyon National Park below Glen Canyon Dam Environmental Assessment (EA). Both the Department and the National Park Service (NPS) share common objectives in Glen Canyon and Grand Canyon to maintain and enhance the Blue Ribbon Rainbow Trout Fishery at Lees Ferry, and to maintain and enhance native fish populations in Marble and Grand Canyons. We view many of the proposed tools provided in the EA as important to the management of those shared objectives. The Department has reviewed the EA and has the following comments.

The Arizona Game and Fish Commission (Commission), under Title 17 of the Arizona Revised Statutes Â§ 17-102, codifies state ownership of wildlife and gives the Department authority, acting as the agent of the Commission, to oversee management and regulation of take of fish and wildlife within the state of Arizona irrespective of land ownership except those wildlife existing on tribal trust-status lands. The Department's authorities include jurisdiction over fish, both native and non-native, residing in the Colorado River below Glen Canyon Dam. Furthermore, Secretary Zinke recently sent a memo on September 10th, 2018, reaffirming the authority of the States to exercise their broad trustee and police powers as stewards of the Nation's fish and wildlife species on public lands and waters under the jurisdiction of the Department of the Interior. As such, the Department appreciates the recognition by NPS in consulting and seeking consensus regarding the development, implementation, and adaptation of triggers for these actions. We request that the language "NPS will seek and obtain federal and state permits as required" be applied throughout the document under any of the tools that involve the direct or indirect take of wildlife. Wildlife is defined in Title 17 as all wild mammals, wild birds, and the nests or eggs thereof, reptiles, amphibians, mollusks, crustaceans and fish, including their eggs or spawn. Further, in an attempt to improve conservation of fish and wildlife and encourage a good neighbor policy with the Department of the Interior (DOl), the Department intends to partner with NPS on the implementation of these tools in Glen and Grand canyons through the issuance of Scientific Collection Permits or a Memorandum of Agreement, which can be used to streamline the permitting process. The application and issuance of these permits ensures that the requirements under Title 17 for the take of wildlife will be met as we move forward with

addressing future threats to our cooperative management of Glen and Grand canyons. As such, please remove "As the action agency, NPS retains final decision-making authority" when discussing the take of wildlife as we feel the language does not reflect the spirit or intent of the Secretary Zinke memo directing DOl agencies to defer fish and wildlife management on DOl lands and water to the States.

Monitoring the impacts of actions is mentioned throughout this document. This monitoring is necessary for the progression throughout the tiers of actions mentioned and for the assessment of success in meeting management objectives of these actions. Many of the actions include the following language when describing the offramps for these actions: "action is ineffective at achieving XXXXX". Please define what an acceptable result is when analyzing XXXXX, what metric is utilized and how these metrics will be monitored. Here is an example: NPS recognizes a potential socioeconomic impact to the Lees Ferry Fishery within this EA. In recognizing this potential impact, NPS states that "Regular monitoring, triggers, and off ramps are expected to detect any such affect and allow for responsive action to prevent adverse impacts" (Page 70, Paragraph 1). The Department appreciates the need for socioeconomic monitoring but is unaware of any current monitoring. Please define triggers that will be in place and how this important metric will be monitored such that the appropriate off ramps are ensured.

On Page 43 Paragraph 3 NPS states: "Mechanical disruption of spawning substrates by flushing with high-pressure water, mechanical displacement of gravel, or placement of temporary electrical grids or substrate covers (primarily from November 1 through February 28 for Brown Trout) would result in localized disturbance of aquatic habitat. Although the timing would be different, it is expected that the overall amount of disturbance from flushing or mechanical displacement of substrates within treated areas would be no greater than the effects of HFE." The Department believes that there is not enough description of this activity to make this assessment of the estimated impacts. Without a description of the scope, location, duration and timing of this activity, the effects cannot be evaluated. Please provide a more defined description of what tools will be used and where they will be used such that an evaluation of their impacts can be done. Flushing with high-pressure water and mechanical displacement of gravel can potentially have negative impacts to gravel at spawning areas. Since there is no source of fine gravel in the Lees Ferry reach, these impacts can be long-lasting if not permanent.

The Department is hesitant to allow the live transportation of aquatic wildlife from waters with known aquatic invasive species. Quagga mussels and New Zealand mudsnails are two highly invasive aquatic species occurring at Lee's Ferry. Relocating any species from the waters within Glen Canyon would pose an unacceptable level of risk of transporting these aquatic invasive species to waters outside of Glen Canyon. Although, Quagga mussels currently exist at Lake Powell where this EA proposes translocation of fish, New Zealand mudsnails are very resilient and fish stocking and fish movement are known pathways of spread. These mudsnails are known to pass through the digestive system of trout and many other fish species unharmed and viable. As they reproduce exclusively through cloning in North America, and juveniles can be the size of a grain of sand, this also poses an unacceptable level of risk. Translocation of fish could start a new invasion elsewhere. Other invasive species of concern that could be spread as a result of relocation of fish from Lee's Ferry include: Asian clams, riparian and aquatic plants such as Tamarix spp., and fish disease such as whirling disease. Arizona has also seen an increase of

invasive mussels such as the giant floater of the family Unionidae, of which part of the life cycle is parasitic, where the microscopic larva attach themselves to the gills of fish and are easily spread through fish transfer and aquaculture operations. Transportation of known aquatic invasive species is illegal in Arizona and against the Department's Best Management Practices. Furthermore, the Department has stringent and regimented fish health standards and disease testing practices prior to the stocking or translocation of any fish species within the state. The actions proposed within the EA may violate these standards and practices.

The Department only supports chemical control of undesired fish species with EPA registered piscicides when the root cause of the invasion has been mitigated. The Department does not support frequent and repeated use of registered piscicides in the absence of appropriate mitigation of the root cause. Given the fact that the Upper Slough has now been treated 4 times with Rotenone or ammonia, the Department believes that it is imperative that a more permanent solution is implemented quickly.

The Department requests that all language regarding unregistered substances utilized specifically to kill fish (soda ash, ammonia or other naturally occurring chemicals) be removed from this document. These chemicals are mentioned in numerous locations throughout the document with the implied sole purpose of managing fish populations through lethal removal. As unlicensed chemicals, these can only be utilized experimentally on limited occasions, as research dictates and with the appropriate permits and licenses. The Department believes that research necessary for the EPA certification of these chemicals as piscicides is important but that this research falls outside of the purview of the management actions proposed and evaluated in this EA. The Department requests the following information prior to any future treatment with these chemicals. These requirements apply to anyone in the State of Arizona, including the Department, for the experimental utilization of unregistered chemicals:

1. Application Plan
a. Project applicator and certification.
b. Project location (with map) including description and size of treatment area, land ownership, and any potential for public access.
c. Project description:
i. Statement of purpose.
ii. Target species for removal.
iii. Non-target species in the area that may be impacted by the treatment.
iv. Application plan including all estimated application rates.
v. Proposed dates and duration.
vi. Estimated crew size and their certifications (if applicable).
vii. Post-treatment monitoring (if applicable).
viii. Documentation on coordination with federal agencies (if application is on federal lands).
2. Applicable laws and regulations.
a. Arizona Department of Agriculture R3-3-212 Experimental Use Permit and R3-3-303 Experimental Use.
b. Arizona Department of Agriculture Certified Pesticide Applicator License.
c. EPA Experimental Use Permit if over 1 surface acre in size.
d. Arizona Department of Environmental Quality Notice of Intent and Pesticide Discharge

Management Plan.

Furthermore, since the use of unregistered chemicals to kill fish legally requires appropriate permits, Please replace the language on Page 26, Paragraph 1 "seek state permits for implementation of this action as appropriate" with " obtain federal and state permits as required prior to the use of these chemicals".

The Department applauds the inclusion of incentivized harvest by anglers as an action to remove or reduce unwanted fish species. We are encouraged that the NPS has committed to a period of at least three years of incentivized harvest prior to implementation of other tiers. The Department believes that it is likely that an experienced individual angler will only catch one or two Brown Trout per day at the current densities at Lees Ferry. It is our hope that the NPS will select a dollar amount per fish that will truly incentivize the take of these coveted sportfish and will in tum successfully test this action. We believe that adequate funding for this activity and appropriate rewards for individual fish are necessary to achieve the management objectives of this proposed activity. The Department looks forward to discussing the implementation of this program and to the selection of the appropriate incentive in order to make this program successful.

We thank you for the opportunity to comment on this document and look forward to working with the NPS and other stakeholders to develop a set of tools to best meet the management objectives shared by the Department and NPS.

55

The Pueblo of Zuni has received and reviewed the public draft of the Environmental Assessment for the Expanded Non-native Aquatic Species Management Plan in Glen Canyon National Recreation Area and Grand Canyon National Park below Glen Canyon Dam. The Pueblo of Zuni appreciates the opportunity to provide the National Park Service with our comments on this Environmental Assessment (EA).

The Pueblo of Zuni compliments the National Park Service for designing a non-native aquatic species management plan that appears to be, in part, responsive to objections expressed by Zuni regarding the taking of life that has been integral to past National Park Service management actions designed to control undesirable non-native aquatic species. The proposed tiered approach and associated live removal presented in this document seems to move toward a more conscientious aquatic non-native management plan.

There are, however, five management actions (mechanical disruption of early life state habitats (Ml; tier 2), mechanical removal (M2; tiers 1, 2, or 3), sonic concussion devices (M3; tier 4), application of piscicides and application of herbicides) are presented that are designed to end the life of the undesired, targeted life form. One particular management action, the application of the sonic concussion device is principally inhumane because according to the EA it may result in a prolonged period of suffering for the organism prior to death as a result of tissue damage. The Pueblo of Zuni finds this particularly troubling and an unacceptable way to treat any living being.

The document is noticeably deficient in consideration and evaluation of the effects of implementing this expanded non-native aquatic species management plan on the unique and special relationship the Zuni people have with all aquatic life and with the Grand Canyon, Colorado River, and little Colorado River as Register-eligible traditional cultural properties. Further, there is no clearly demonstrated effort or consideration by the National Park Service to measure the effects of implementing one or more of these lethal management actions or their resultant cumulative effects over time on the psychological and emotional well-being of the Zuni people. Rather, the impact analysis provided in section 3.5.2.1 Traditional Cultural Properties is viewed as de-emphasizing and lightly considering the impacts to Zuni.

The Pueblo of Zuni considers the document insufficient because it fails to acknowledge and therefore consider in the analysis Zuni Tribal Council Resolution M70-2010-C086 which calls upon the Department of the Interior, and all agencies thereof, to adhere to their trust responsibility by managing Zuni cultural and natural resources, including tangible and intangible cultural resources valued by the Zuni people wherever such resources may occur, in a manner responsive to the interests of the Zuni Tribe and its members. Clearly, the implementation of this requirement of the trust responsibility to Zuni is not achieved in section 3.5.3.

Finally, it is the position of the Pueblo of Zuni that any implementation of the mechanical disruption of early life state habitats, mechanical removal of undesired non-natives, employment of sonic concussion devices, and/or application of piscicides or herbicides will constitute an adverse effect to a Register-eligible Zuni traditional cultural property and will necessitate, by law, the National Park Service to consult with the Pueblo of Zuni to consider and design potential mitigative strategies and the resultant development of a Memorandum of Agreement.

56

The following are comments pertaining to the "Expanded Non-Native Aquatic Species Management Plan in Glen Canyon Recreation Area and Grand Canyon National Park below Glen Canyon Dam Environmental Assessment (EA), prepared by the National Park Service (NPS). Our comments are relatively limited, and mainly focus on and support the concerns raised by other tribes, namely the Zuni and Hopi, related to lethal removal of non-native fish.

The concept of "beneficial use" is noted in numerous places throughout the EA. Specific examples of what beneficial use might entail (storing for human consumption or transporting to Tribal aviaries) are noted on page 8 of the EA. This approach is laudable and we appreciate NPS' inclusion of such language proactively.

The frequently used clause "beneficial use whenever possible," however, seems to qualify NPS' commitment to follow through. Given the remarkable amount of planning, preparation, and science and technology involved in carrying out the provisions of the proposed undertaking, there should be no need to qualify this commitment. Although it is clear that there are many unknowns with many variables at work as the conditions in the Colorado River continue to change, earnest consultation and communications between NPS and the Tribes should be able to overcome unforeseen circumstances and even lead to innovative and creative solutions.

As a matter of principle, any management actions that involve lethal removal of fish should

provide for a beneficial use, period. We recommend that there should be specific provisions in the EA to develop a protocol for how this will be accomplished, including a proposed timetable for when the protocol will be developed.

Aside from this overall comment, we have a few specific points:

In Table 3-1, Humpback chub are noted as only being present as far downriver as Separation Canyon. Are they not also present further down? Bonytail chub and Colorado pikeminnow are noted as being present in Lake Powell, but extirpated from Grand Canyon. It seems that

Lake Mead would also provide suitable habitat. How confident are we that these species do not occur in the lower canyon?
Pg. 64. Section 3.5.3. For the sake of accuracy, this should be corrected to state that "portions of the project area are bounded." For the Hualapai Reservation, this comprises 108 miles in the western Grand Canyon.

Pg. E-7. Second from last paragraph. Although the Hualapai Tribe recognizes the stretch of river from the Little Colorado confluence on down as ancestral territory, we would like to see expanded research along the stretch of river from RM164.5 to 273, particularly below Diamond Creek, to determine whether the numbers and percentages of non-native species are increasing or declining.
Pg. G-1. We appreciate that personnel from the Hualapai Dept. of Natural Resources participate in various fish studies conducted by the Fish & Wildlife Service. Could we explore ways to formalize this participation, and include studies conducted by NPS and GCMRC as well?

57
Sir I find it wrong to reduce the brown trout population for the benefit of the chubs who have plenty of habitat down river. The cooler water is beneficial for the trout not chubs, so please leave the brown trout for us who enjoy them.

58
As co-presidents of the Payson Flycasters' Club we are writing to express the great concern of our fifty three members over several aspects of the National Park Service (NPS) plan regarding the Environmental Assessment (EA) for an Expanded Non-native Aquatic Species Management Plan and the severe impact we believe it will have on the Blue Ribbon Rainbow Trout Fishery in Lees Ferry.

We understand the desire to protect endangered species in the river, but the efforts outlined for Lees Ferry are short-sighted in that they do not address the root causes to the problem. Meaningful, long-term solutions will require a great deal of cooperation with the other agencies that have responsibilities in the area. Currently the Arizona Game and Fish Department (AZGFD) has the ability to monitor and if needed, work on addressing the brown trout population in the Lees Ferry area. It is our strong belief that you must effectively partner with the AZGFD in any efforts to manage the rainbow trout fishery at Lees Ferry. Your document notes on several pages that the NPS retains final authority to move to more severe tiers at your

discretion. This is entirely counter to the wording in the September 10, 2018 letter from Secretary Zinke. In that letter addressed to federal agencies he noted: "The Department recognizes States as the first-line authority for fish and wildlife management and hear-by expresses its commitment to defer to the States in this regard except as otherwise required by Federal law." We urge you to reflect the intent of Secretary Zinke's directive in your document and allow AZGFD to take the lead on managing the fish and wildlife in the Lees Ferry reach as well as other joint use areas within Arizona.

In the EA, we believe that you have significantly underestimated the impact to the fishing experience, guide services, and the local economy around Lees Ferry by the actions proposed in your plan. The movement to tier 2 and 3 would drastically impact fishing perceptions regarding Lees Ferry. This Blue Ribbon Rainbow Trout Fishery will have scoured redds in prime fishing locations that will certainly impact the fishing experience and alarm anglers to the likely disruption of this world renowned fishery. If tier 3 is implemented, then the plan for 40 consecutive nights of intensive electro-shocking in the reach will certainly impact the fishing success of anglers, but of even more concern to anglers, lead to potentially high mortality of the prized rainbow trout in the river. Guide services and local businesses would be devastated from this action as anglers no longer see Lees Ferry as a prime fishing location. We urge you to study the perception and economic impact more thoroughly and strongly reconsider these more severe tiers on the fishery.

There are several numbers in the document that we question. Your estimates on the threat of brown trout on the humpback chub population downriver is based on a model that uses a very limited recent increase in brown trout numbers as the premise for your actions. There have been fluctuations in the trout and humpback chub population for years. In fact, the humpback chub population numbers are robust in the Little Colorado River and further downstream. We urge you to increase your adult brown trout telemetry data, from the very small sample size for which you currently have information, prior to enacting more severe tiers to determine with greater assurance that the brown trout in Lees Ferry are moving downstream in the numbers that would warrant removal actions.

Another set of numbers that is of concern to us are reference in tier 3. A population of 20,000 adult brown trout in the Lees Ferry reach would be a concern to not only the humpback chub population downriver, but also the rainbow trout fishery itself. We would support actions to reduce brown trout if that number of adult brown trout is reached in Lees Ferry. You acknowledge in the plan that you would cease mechanical removal efforts if that number were reduced to 10,000 adult brown trout. Why then is 5,000 the trigger for the first part of tier 3?

We appreciate the addition of the incentivized harvest tier in the EA. We believe that is the most impactful and least invasive action that can be taken. Again, we urge you to reevaluate the other actions in tier 2 and 3. We also expect greater efforts on your part to collaborate with AZGFD and the leadership role that Secretary Zinke expects in managing this area.