United States Department of the Interior

BUREAU OF RECLAMATION
Upper Colorado Regional Office
125 South State Street, Room 6107
Salt Lake City, Utah 84138-1102

IN REPLY REFER TO:

UC-700
ENV-9.00

JUL 2 5 2003

Dear Interested Parties:

The enclosed document is a supplement to an environmental assessment that was sent out for public comment in September 2002 by the Bureau of Reclamation, U.S. Geological Survey, and the National Park Service. It is being sent to you by the Bureau of Reclamation on behalf of the other two Federal agencies. The environmental assessment analyzed the effects of proposed experimental releases from Glen Canyon Dam and mechanical removal of non-native fish from the Colorado River in Grand Canyon. Both actions were proposed to improve conditions for the survival of the endangered humpback chub in Grand Canyon National Park.

Due to the high success in mechanical removal of non-native fish, the Federal agencies are proposing to expand the area of that action approximately 7 miles further downstream in the Colorado River. The enclosed document provides the following information: results of the ongoing mechanical removal, a description of the proposed modification, actions required for the proposed modification to occur, effects of the proposed modification on resources in the project area, cumulative impacts of the proposed modification and other proposed or ongoing Federal and non-Federal projects, and environmental commitments made by the Federal agencies in conducting the proposed modification.

If you have any concerns or issues with the proposed modification and wish to provide comments to the Federal action agencies, please contact Dennis Kubly by e-mail at dkubly@uc.usbr.gov or by letter at the following address:

Bureau of Reclamation
Upper Colorado Region
125 South State Street
Salt Lake City UT 84138-1147

Your comments will need to be postmarked no later than August 8, 2003. Once the public comments have been received and reviewed, the Federal action agencies will make a decision on whether to proceed with the proposed modification.

Sincerely,

Randall V. Peterson
Manager, Environmental Resources Division

Enclosure

PROPOSED MODIFICATION TO MECHANICAL REMOVAL OF NON-NATIVE FISH FROM THE COLORADO RIVER IN GRAND CANYON, ARIZONA

BUREAU OF RECLAMATION
Upper Colorado Region
Salt Lake City, Utah

U.S. GEOLOGICAL SURVEY
Grand Canyon Monitoring and Research Center
Flagstaff, Arizona

NATIONAL PARK SERVICE
Grand Canyon National Park
Grand Canyon, Arizona
Glen Canyon National Recreation Area
Page, Arizona

July 2003

INTRODUCTION

In September 2002, the Bureau of Reclamation, National Park Service and U.S. Geological Survey released an environmental assessment on proposed experimental releases from Glen Canyon Dam and removal of non-native fish from the Colorado River in Grand Canyon (Department of the Interior 2002). The experiment was developed by the Grand Canyon Monitoring and Research Center (GCMRC, U.S. Geological Survey), cooperating scientists, and the Technical Work Group of the Glen Canyon Dam Adaptive Management Program. It was recommended to the Secretary of the Interior by the Adaptive Management Work Group, a Federal Advisory Committee charged with providing input to the Secretary pursuant to fulfilling provisions of the Grand Canyon Protection Act. In December 2002, following public meetings and responses to comments by the federal agencies, the Secretary of the Interior concurred with a Finding of No Significant Impact for the proposed project and agreed that it should move forward.

In January 2003 GCMRC began implementation of non-native fish control in the Little Colorado River (LCR) inflow area of the Colorado River in Grand Canyon. The objective of this experiment is to reduce the number of non-native fishes that potentially prey on or compete with the federally endangered humpback chub (HBC, *Gila cypha*) in this reach of the river. The fish control effort uses electrofishing and has three primary purposes: a) determine the efficacy of this technique to reduce and control the number of non-native fishes in critical habitat for the humpback chub, b) assess native/non-native fish interaction by conducting diet and incidence of predation studies on non-native fishes

(primarily rainbow and brown trout), and c) reduce the abundance of non-native fishes in the control reach as much as practicable.

The proposed action was to conduct six removal trips per year below Lees Ferry, from river mile (RM) 56.2 -65.7, during 2003 and 2004. To determine if differences in fish population characteristics (e.g., relative abundance and size structure) in the removal reach are a function of other environmental influences and not the mechanical removal, a control area was established (RM 44–52). During each trip, 24 randomly selected sites within the control reach are sampled to estimate the relative abundance and size structure of native and non-native fishes inhabiting this reach.

Mini-hoopnets are used to estimate the relative abundance (catch rate) of HBC at standardized sites downstream of the LCR confluence. Nets are deployed for three nights during the removal operations at times when electrofishing activities are not being conducted at hoopnet sites.

Results of the Ongoing Mechanical Removal

Total Sampling Effort and Catch

A total of 21,304 minutes (355 hours) of electrofishing effort was expended during the January, February, and March 2003 removal trips (Coggins and Yard 2003). Total electrofishing catch in the removal reach was 7,573 fish. The numerically dominant species was rainbow trout with a combined catch over the three trips of 6,703 (89%). Catches of the remaining non-native fishes represented about 4% of the total catch with brown trout (130 fish) and common carp (135 fish) being the predominant species. Native fishes constituted 7% of the total catch: flannelmouth sucker (430 fish), humpback chub (65 fish), bluehead sucker (37 fish) and speckled dace (17 fish.

Depletion Abundance Estimates

Depletion abundance estimates were attempted for rainbow trout, brown trout, and common carp at three geographic scales: 1) upstream of the LCR confluence 2) downstream of the LCR confluence, and 3) within the entire removal reach. The sum of the upstream and downstream estimates does not necessarily equal the total reach estimate because the estimators are independent and based on stratified or pooled data.

Rainbow trout. Rainbow trout depletion data displayed the declining and strongly linear pattern expected in depletion type experiments for each of the geographic scales. Initial estimated January rainbow trout abundance was 6,499 throughout the removal reach. A total of 3,606 rainbow trout was removed during the January trip resulting in an ending abundance of 2,893 and an overall removal efficiency of 55%.

Initial rainbow trout abundance during the February trip was estimated as 2,935 fish. Abundance estimates in the upstream and downstream sections suggest that rainbow trout had a similar geographic distribution during January and February, with approximately

22% of the rainbow trout found below the LCR confluence in both months. Comparison of the January final abundance with the initial abundance in February at all three geographic scales suggests minimal net immigration into the removal reach. In February 1,898 rainbow trout were removed resulting in an ending total abundance estimate of 1,037 fish and a removal efficiency of 65%.

The March estimate of initial rainbow trout abundance within the entire reach was 1,978 fish, suggesting an overall net immigration of 941 rainbow trout since the end of the February trip. A comparison of the final February abundance with the initial March abundance shows virtually no net immigration in the downstream reach, but nearly a doubling of abundance in the upstream reach. Additionally, the estimate of initial rainbow trout abundance during March suggests that only 15% of the total abundance was below the LCR confluence. These two observations suggest that there may have been immigration between February and March, but only within the upstream reach. A total of 1,196 rainbow trout was removed during March, which resulted in a final abundance estimate of 782 fish and a removal efficiency of 60%. Approximately 8% of the rainbow trout were concentrated below the LCR confluence (66 fish) following the March trip and nearly 92% resided in the upstream reach (687 fish).

Brown trout. Brown trout depletion abundance estimates are somewhat problematic. The desired negative linear relationship between cumulative catch and catch rate was not always realized. However, there was a systematic and large reduction in both catch rate and total removals from January to February, and to a lesser degree from February to March. Removal efficiency estimates varied from a low of 26% in February to a high of 65% in January. This variability is indicative of differences in catchability between and within sampling months, and is suggestive of differences in immigration rates or shoreline habitat use.

Common carp. Estimates of depletion for common carp, as evidenced by model fit and consistency, were generally better than brown trout, but not as good as rainbow trout. For data collected during January and March, abundance estimates in the upstream section were not possible owing to a pattern of increasing catch through the depletion passes. However, the estimators of abundance for both the total reach and the downstream reach consistently produced positive estimates. For the total removal area, the January final estimate was identical to the February initial estimate, suggesting reasonably good performance and low net immigration. Catch-rate estimates and total removals declined between January and February in the downstream section and in total, but increased slightly within the upstream section. Removal efficiencies for common carp, which ranged from 67% to 92%, were higher than either brown trout or rainbow trout.

PROPOSED MODIFICATION TO MECHANICAL REMOVAL

The proposed modification does not include any change in experimental releases from Glen Canyon Dam. It includes only the mechanical removal of non-native fish. The effectiveness of the ongoing non-native removal has exceeded expectations at the initiation of this action and this realization has lead to a proposal to expand the removal

reach for non-native fish in the Colorado River below the LCR. The proposed modification would extend the original area of removal downstream to RM 72.7, adding 7 miles to the area below the LCR. Monitoring and limited electrofishing in the original removal reach (RM 56.2 -65.7) would continue at a frequency sufficient to ensure that non-native fish abundance is maintained at less than 10% of the abundance observed in January 2003. Most electrofishing and removal would be focused between river mile 65.7 and 72.7 during the fifth and sixth trips in 2003 and allocated as needed during 2004 to sustain a 90% reduction in non-natives through the entire reach (RM 56.2-72.7). To assess potential responses in HBC and other native fish populations, hoopnets would also be positioned in the expanded reach.

Actions Required for the Proposed Modification to Mechanical Removal

In addition to this supplement to the environmental assessment, modified permits will have to be secured from the National Park Service, Fish and Wildlife Service, and the Arizona Game and Fish Department. Reconsultation with the Fish and Wildlife Service will have to occur on effects to all species listed under the Endangered Species Act. No lands belonging to Native American tribes are involved in the downstream expansion, but tribes that previously expressed concerns over the proposed action are being consulted on this modification.

Effects of the Proposed Modification to Mechanical Removal

The proposed modification has several additional advantages and could be conducted at no increased cost from the original proposal. Furthermore, it could potentially increase near-term recruitment of HBC. Advantages of this modification include: (1) reducing the amount of electrofishing that adult and juvenile HBC are subjected to in the LCR inflow area, (2) increasing the amount of hoop net sampling for juvenile HBC throughout the removal reach, (3) reducing the amount of scientific activity near the mouth of the LCR, an area of the river that is subject to high recreational use and of high cultural significance to Native Americans, and concentrating that effort in fewer river miles downstream. Some increase in contact between researchers and river runners will occur in the expansion reach, but this reach contains few sites used for overnight camping. Effects of the proposed modification on other resources evaluated in the September 2002 environmental assessment are expected to be not measurably different from the effects identified in that document.

Young humpback chub (HBC) entering the mainstem from the LCR almost exclusively occupy habitat downstream of the LCR. The removal area upstream of the LCR is intended largely as a buffer to reduce the likelihood of immigration downstream by non-native fishes. Extending the area of removal downstream by 7 miles could more than double the potentially improved habitat for young HBC and result in improved survivorship.

No changes in environmental effects due to the proposed modification are expected when compared with those identified for the proposed action (Department of the Interior, 2002)

in the following categories: (1) unavoidable adverse impacts, (2) irreversible and irretrievable commitments of resources, (3) impairment to National Park Service resources, and (4) Indian trust assets.

CUMULATIVE IMPACTS

No new related projects, either Federal or non-Federal, have been identified in addition to those evaluated by the Department of the Interior (2002). Grand Canyon National Park has completed their feasibility assessment for removal of brown trout from Bright Angel Creek and they are moving forward with NEPA and ESA compliance for instituting a 4-5 year removal effort to reduce that population within the National Park (personal communication, Jeff Cross, Grand Canyon National Park).

ENVIRONMENTAL COMMITMENTS

Under the ongoing proposed action, GCMRC has committed to remove from Grand Canyon non-native fish that are euthanized and deliver them to the Hualapai Nation for use as fertilizer in tribal gardens. This commitment will continue under the proposed modification and include non-native fish removed from the expanded reach of the Colorado River. River runners will be advised of the nature and location of the mechanical removal prior to their launch from Lees Ferry.

LITERATURE CITED

Coggins, L. and M. Yard. 2003. Mechanical removal of non-native fishes in the Colorado River in Grand Canyon: update of winter 2003 operations and findings. Grand Canyon Monitoring and Research Center, Flagstaff, Arizona. 42 p.

Department of the Interior. 2002. Proposed experimental releases from Glen Canyon Dam and removal of non-native fish. Bureau of Reclamation, National Park Service, and U.S. Geological Survey. Upper Colorado Region, Bureau of Reclamation, Salt Lake City, Utah. September 2002. 112 p. + appendix.

PRESS RELEASE

Experimental effort to benefit native fish being expanded in Grand Canyon

An experimental effort by the Glen Canyon Dam Adaptive Management Program to benefit the endangered humpback chub in a small section of the Colorado River in the Grand Canyon is being expanded. Humpback chub have been affected by a variety of factors such as dam operations, cold-clear water, competition and predation by nonnative fishes, and diseases.

Trout and other non-native fish are known to feed upon native humpback chub, which is an endangered species. The experiment entails removing these species of fish to give humpback chub a better chance at survival and hopefully, increased reproduction and recruitment.

The area being targeted is in a portion of the Grand Canyon seldom fished by anglers, other than occasional river rafters. The current project area is 10 miles long and approximately 60 miles downstream from Lees Ferry, which is a renowned trout fishery below Glen Canyon Dam. The proposed modification would expand the experiment seven miles downstream, to a point 12 miles below the mouth of the Little Colorado River.

The experiment responds to specific Adaptive Management Program goals that include maintaining a quality rainbow trout fishery at Lees Ferry while protecting and enhancing native fish populations downstream of Lees Ferry. It also responds to National Park Service management policies that favor native species within national parks. The removal effort is designed to benefit native fish downstream from Glen Canyon Dam without impacting the tail-water trout fishery.

The experiment was developed and recommended to the Secretary of the Interior by the Adaptive Management Work Group, a Federal Advisory Committee that includes 25 stakeholders made up of Federal agencies, State agencies, Native American Tribes and non-governmental organizations, as part of the ongoing Glen Canyon Dam Adaptive Management Program. It is being implemented by the Bureau of Reclamation, U.S. Geological Survey and National Park Service. The research is being conducted by U.S. Geological Survey's Grand Canyon Monitoring and Research Center based in Flagstaff.

The initial portion of the experiment was conducted this year from January through March and resulted in removing 7,573 fish, with 6,703 of them rainbow trout. There were also 130 brown trout and 135 common carp removed.

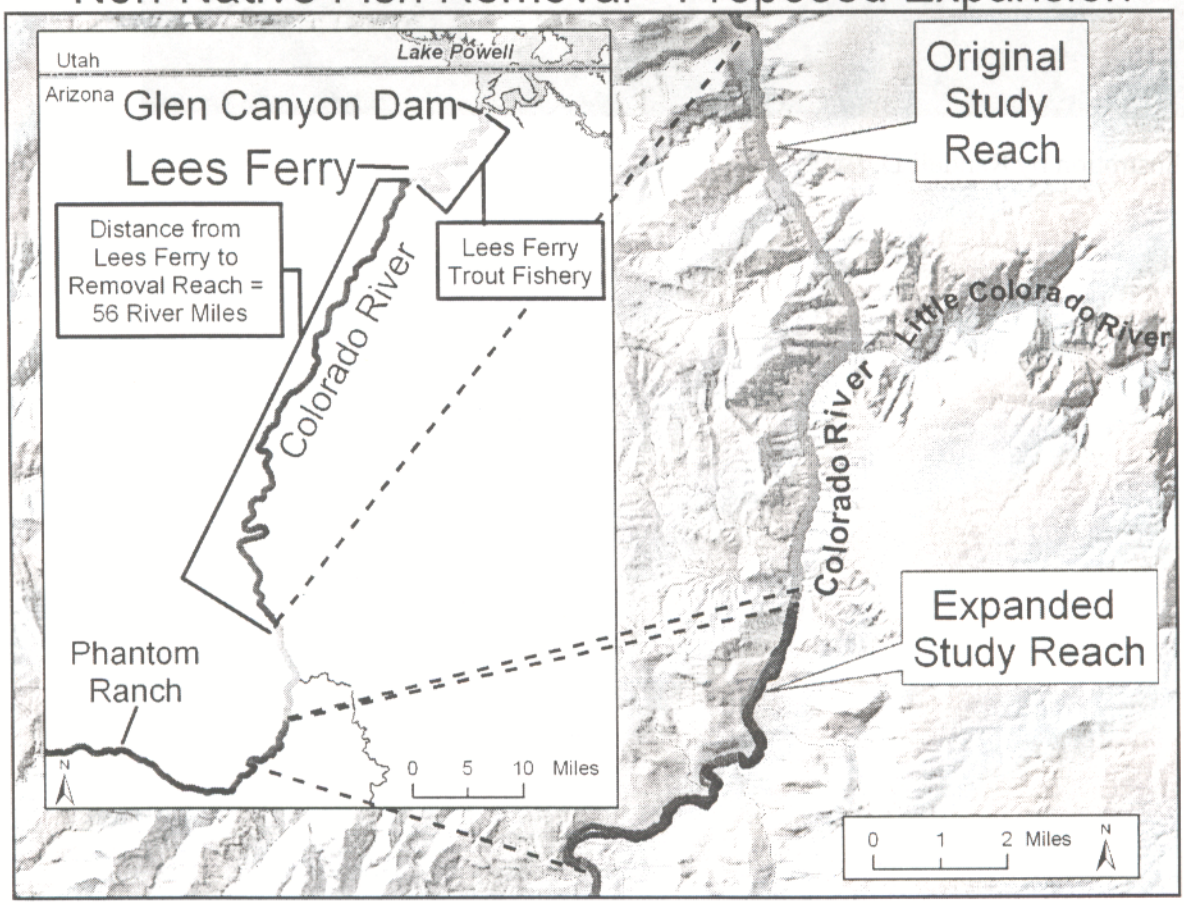
The non-native fish removal experiment is part of the adaptive management process. This is just one small reach of river in the 277-mile Grand Canyon, but the effort has been more successful than originally anticipated. This unexpected success has led scientists to recommend downstream expansion of the project. If successful, the expansion should increase the amount of improved habitat for humpback chub by removing predators.

"Now we will have to monitor to determine if reduced non-native numbers result in a benefit to the humpback chub. That's why it is called adaptive management. You try something, if it works, you can repeat or expand the process to achieve greater results. If it doesn't work, you move on and try something else," said Steve Gloss, a scientist with the U.S. Geological Survey.

Scientists say the worst that can happen is that trout and other non-native fish are removed from a small segment of river that is in the heart of a national park and seldom fished. The advantage of this operation is it can be done now, does not require any elaborate ecosystem alterations and there is little likelihood of encountering unknown and unwelcome environmental surprises.

Footnote: The government agencies and groups cooperating in the Glen Canyon Adaptive Management Program include the Bureau of Reclamation, Western Area Power Administration, Bureau of Indian Affairs, Arizona Game and Fish Department, U.S. Fish and Wildlife Service, Navajo Nation, San Juan Southern Paiute Tribe, Hopi Tribe, National Park Service, Hualapai Tribe, Southern Paiute Consortium, Pueblo of Zuni, Southwest Rivers, Grand Canyon Trust, Grand Canyon River Guides, Federation of Fly Fishers, the seven basin states of Arizona, Colorado, New Mexico, Utah, California, Nevada and Wyoming, the Colorado River Energy Distributors Association and Utah Associated Municipal Power Systems.

Non-Native Fish Removal - Proposed Expansion



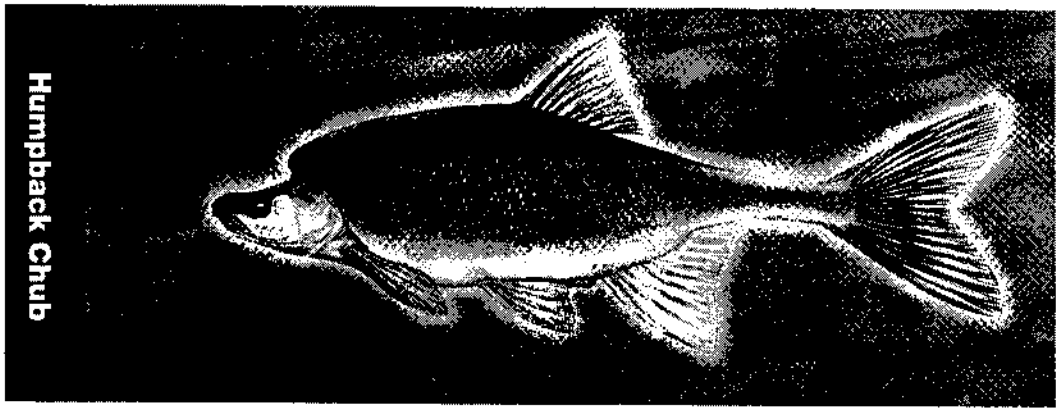


Illustration by Randell D. Babb

Background Information

Grand Canyon Trout Removal Experiment

Humpback Chub

The endangered humpback chub is one of eight native fish species that were once abundant in the 277-miles of river flowing through the Grand Canyon. The humpback chub is a "big-river" fish that grows to 20 inches. It is superbly adapted to survive in the wild and turbulent Colorado River that had historic flows ranging from 500 to 300,000 cfs. Small eyes protect it from swirling silt.

Scientific monitoring data for the last ten years indicate that HBC populations have declined. Those declines have been due to a variety of factors, such as dam operations, habitat alteration, predation and competition with nonnative fishes, and parasites.

Experimental Actions to Help Native Fish and Lees Ferry Trout Fishery

The Glen Canyon Dam Adaptive Management Program (http://www.usbr.gov/uc/envprog/amp/) was formed in 1997 to advise the Secretary of the Interior on actions to improve resources in Glen and Grand canyons.

In January 2003, the Glen Canyon Dam Adaptive Management Program began an experiment to remove non-native fish from the Colorado River in the Grand Canyon.

The experiment had two thrusts. One was releasing experimental high-fluctuating flows from the Glen Canyon Dam to disrupt the non-native trout spawn in the Grand Canyon and to attempt to improve growth and condition of the Lees Ferry trout fishery. The other was physically removing non-native trout near the inflow of the Little Colorado River in the Grand Canyon, some 60 miles downstream of Lees Ferry.

One objective of the experiment is to reduce the number of non-native fish that prey on and compete with the federally endangered humpback chub in this reach of river near the Little Colorado River.

Why Extend the Experiment 7 Miles?

Increasing the magnitude of the treatment offers the best chance of obtaining an unambiguous experimental result. The extension will affect a larger portion of the area where humpback chub and non-natives are believed to interact and possibly result in increased survival of juvenile chub.

Young humpback chub entering the main stem of the Colorado River from the Little Colorado River (LCR) almost exclusively occupy habitat downstream of the LCR. They are more vulnerable to predation when they leave the warm, muddy LCR and enter the cold, clear Colorado River. The cold water from Glen Canyon Dam makes it difficult for small native fish to swim, and also severely limits their growth.

The removal area upstream of the LCR is intended as a buffer to reduce the likelihood of immigration downstream by non-native fishes. Extending the removal downstream by seven miles could potentially more than double the improved habitat for young humpback chub and result in improved survivorship.

If the experiment is successful we expect to see improved survival of humpback chub and an increase in their population size. It could take three to four years to see such an increase.

Executive Summary

The Grand Canyon Monitoring and Research Center, at the Direction of the Glen Canyon Dam Adaptive Management Program, began implementation of non-native fish control in the Little Colorado River (LCR) inflow area of the Colorado River in January of 2003 as part of a joint federal action entitled " Proposed Experimental Flows and Removal of Non-Native Fishes". The fisheries objective of this action was to reduce the number of potential predatory and competitor fishes in habitat occupied by the federally endangered humpback chub, *Gila cypha*. The fish control effort uses electrofishing and had three primary purposes: a) determine the efficacy of this technique to reduce and control the number of non-native fishes in critical habitat for the humpback chub, b) assess native/non-native fish interaction by conducting diet and incidence of predation studies on non-native fishes (primarily rainbow and brown trout), and c) reduce the abundance of non-native fishes in the control reach as much as practicable.

The original plan was to conduct six removal trips per year from river mile 56.2 - 65.7 during 2003 and 2004. While results regarding the diet and predation studies are incomplete at this time, it is apparent that both the efficacy of this removal technique and the reductions in abundance of non-native fish have been much more successful than anticipated. This success has prompted GCMRC to examine and propose a modification to the original plan for mechanical removal. The modification would extend the original area of removal downstream to RM 72.7, adding 7 miles to the area below the LCR. Monitoring and limited electrofishing in the original removal reach would ensure that non-native fish abundance is maintained at less than 10% of the abundance observed in January 2003. Most electrofishing and removal would be focused between river mile 65.7 and 72.7 during the fifth and sixth trips in 2003 and allocated as needed during 2004 to sustain a 90% reduction in non-natives through the entire reach (RM 56.2-72.7).

Young of the year and juvenile humpback chub (HBC) entering the mainstem from the LCR almost exclusively occupy habitat downstream of the LCR. The removal area upstream is intended largely as a buffer to reduce the likelihood of immigration downstream by non-native fishes. Extending the area of removal downstream by 7 miles could more than double the area of potentially improved habitat for young HBC. Thus the strength of this experimental treatment would be greater, increasing both the likelihood that a change in HBC survival and recruitment will occur as well as increasing our ability to detect such an increase.

This proposed modification described herein has several additional advantages and could be conducted at no increased cost from the original proposal. Furthermore, GCMRC believes that it has greater probability to increase recruitment of HBC in the near term than other actions under consideration. Advantages of this modification include reducing the amount of electrofishing that adult and juvenile HBC are subjected to in the LCR inflow area, increasing the amount of hoop net sampling for juvenile HBC throughout the removal reach, reducing the amount of scientific activity in an area of the river subject to high recreational use and concentrating that effort in fewer river miles downstream, substantially reducing the amount of scientific activity in an area of high cultural significance to Native Americans

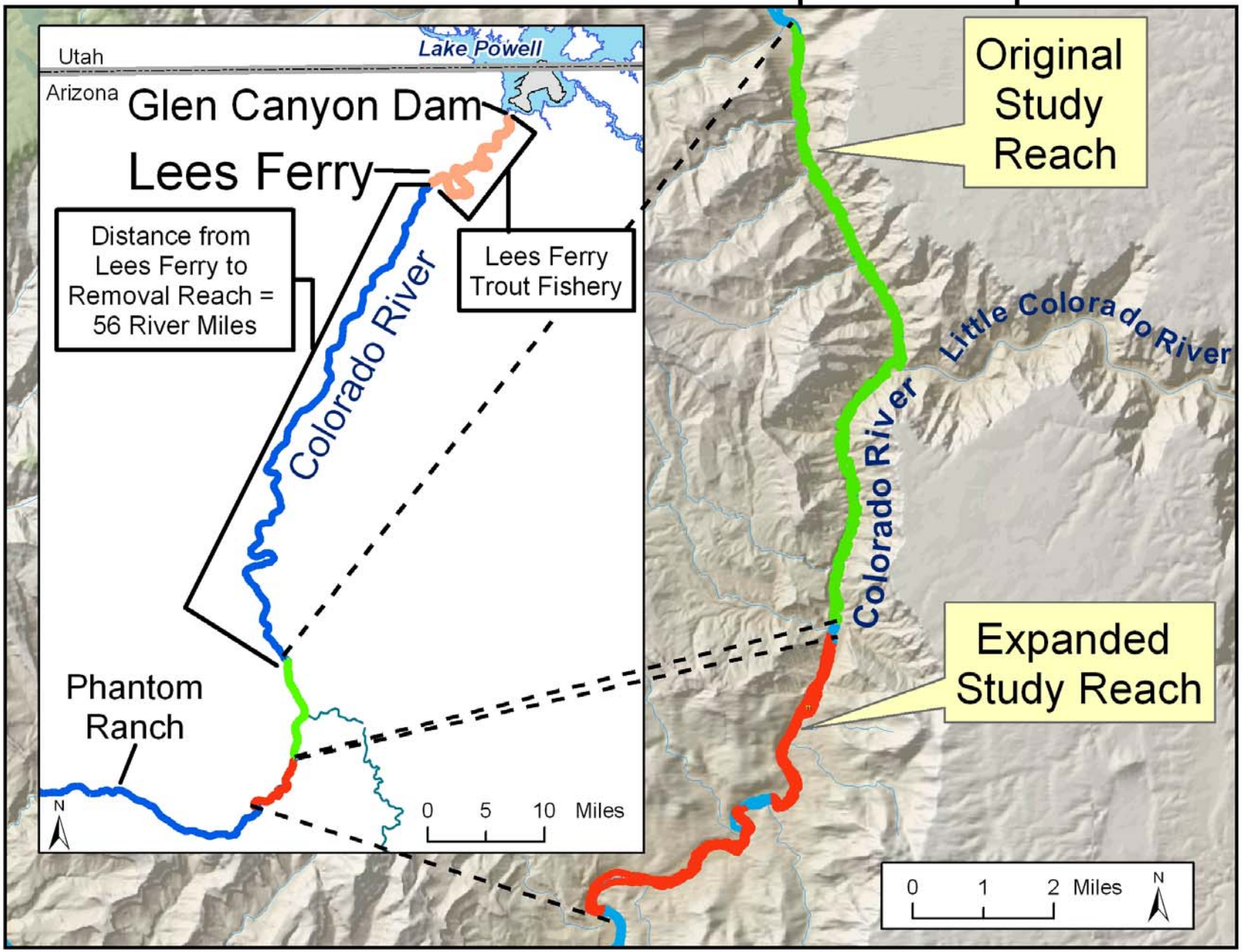
AMWG Conference Call Briefing for Proposed Modification to Mechanical Removal/Non-Native Fish Control Project for August-Sept, 2003

- Background on Original Project Underway
- Preliminary Results Jan-March, 2003
- Motivation for Proposed Modification
- HBC Ad Hoc and TWG Concurrence
- Budget Implications
- Compliance & Schedule
- Action Requested Today

Objectives – What do we want to Accomplish?

- Effect of Adult RBT and BNT in the LCR Inflow Reach on the Population Dynamics of the LCR HBC Population.
  - Will humpback chub recruitment increase as a result of non-native removal?
- Efficacy of Mechanical Removal of Adult RBT and BNT from the LCR Inflow Reach.
  - To what extent can we remove non-native fishes from a ~10 mile stretch of the Colorado River?
- Rainbow and Brown Trout Diet Analysis and Predation.
  - What are non-native fish eating? How many natives?

Non-Native Fish Removal - Proposed Expansion



Mechanical Removal Trips Purpose & Conduct

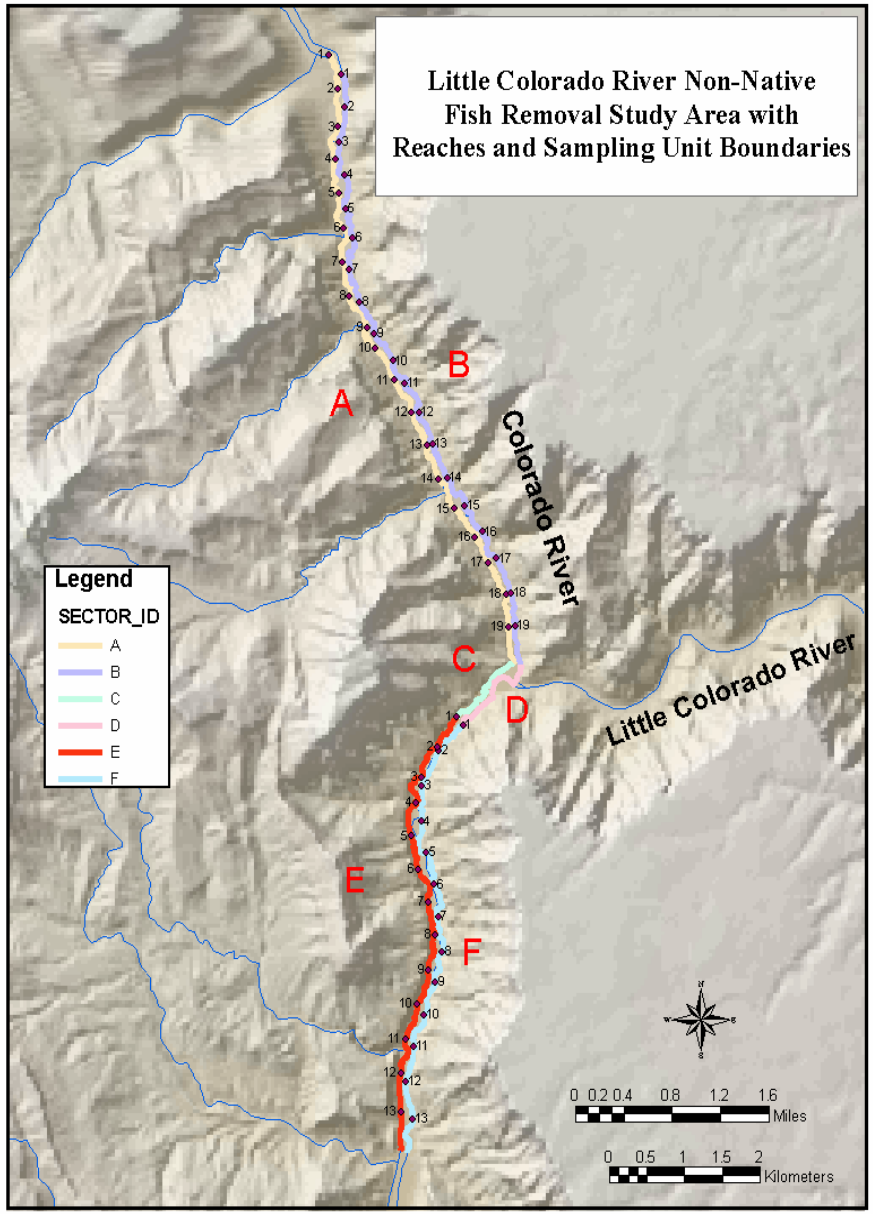
- 6 trips per year (Jan, Feb, Mar, Jul, Aug, Sep) for 4 years (currently for two years)
- Design will allow:
  - Estimation of initial trip abundance for the entire LCR Inflow Reach and cumulative reduction of non-native fish overtime.
  - Estimation of rate of immigration into the removal reach between trips.

Control Reach Field Operations –Day 1&2

- Control Reach (RM 44-52)
  - Purpose is to evaluate changes in trout abundance and size distribution that are a result of factors other than mechanical removal (e.g. fluctuating flows)
  - Each trip, 24 500m sampling units are randomly selected and electrofished to estimate catch-rate.
  - All RBT and BNT >= 200mm are fitted with a floy tag to assess movement and estimate abundance.

Mechanical Removal Field Operations – Day 3-13

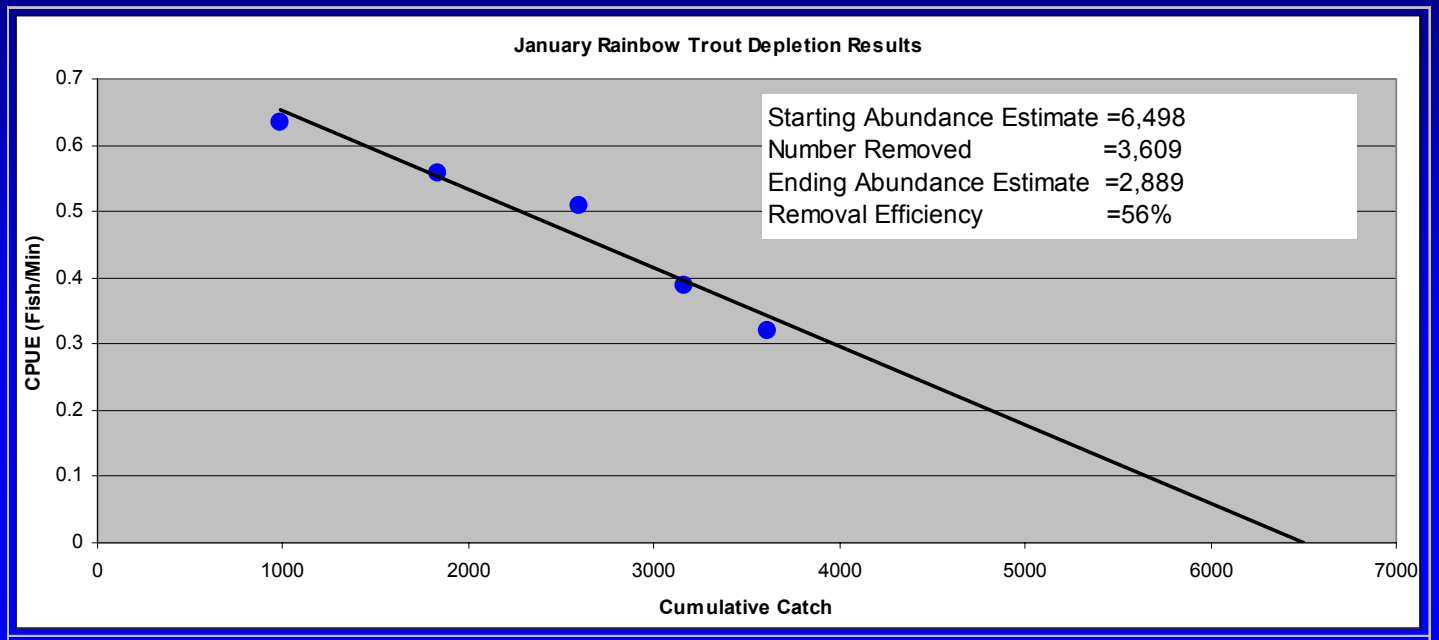
- Camp within the removal reach for 11 days
- 5 pass depletion between RM 56.2 – 65.7
- Each depletion pass takes 2 days
  - Day 1: Kwagunt to above 60 mile rapid and below LCR confluence to below Salt Mine
  - Day 2: Above 60 mile to Science Beach and below Salt Mine to Lava Chuar

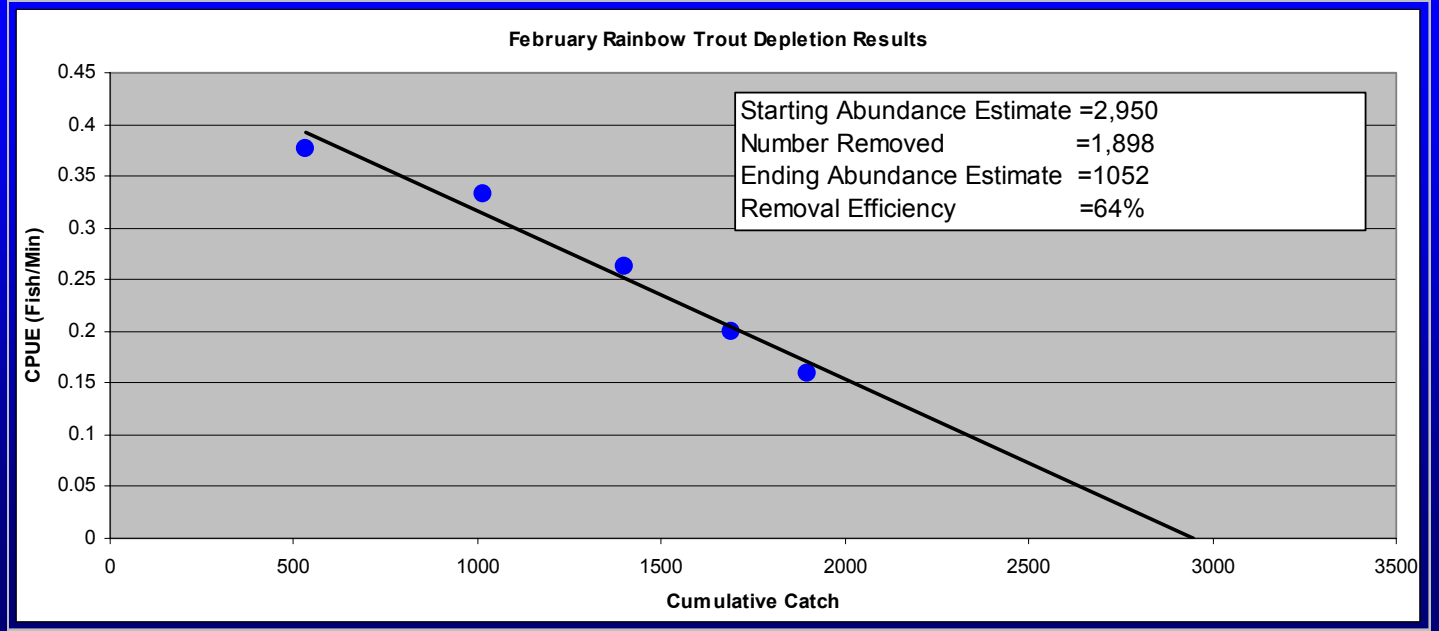


Preliminary Results – Removal Reach Catch

	SPECIES										
Trip	Bluehead Sucker	Brown Trout	Channel Catfish	Common Carp	Fathead Minnow	Flannelmouth Sucker	Humpback Chub	Rainbow Trout	Speckled Dace	Other	Grand Total
January	8	86		80	17	185	26	3609	7	3	4021
February	18	24		33	21	156	26	1898	2	1	2179
March	11	20	1	22	8	89	13	1196	8	5	1373
Total	37	130	1	135	46	430	65	6703	17	9	7573

Preliminary Results – Removal Reach RBT Abundance Estimates





Preliminary Results – Summary

- Non-native removal efforts appear to be much more effective than anticipated (88% reduction after 3 trips).
  - Previous abundance estimates of RBT in the LCR inflow area seem to have over-estimated abundance by an order of magnitude (ADFG 2001).
  - Immigration rates to the removal reach appear to be quite small based on between trip comparisons and AGFD spring monitoring (pending results of July Trip).

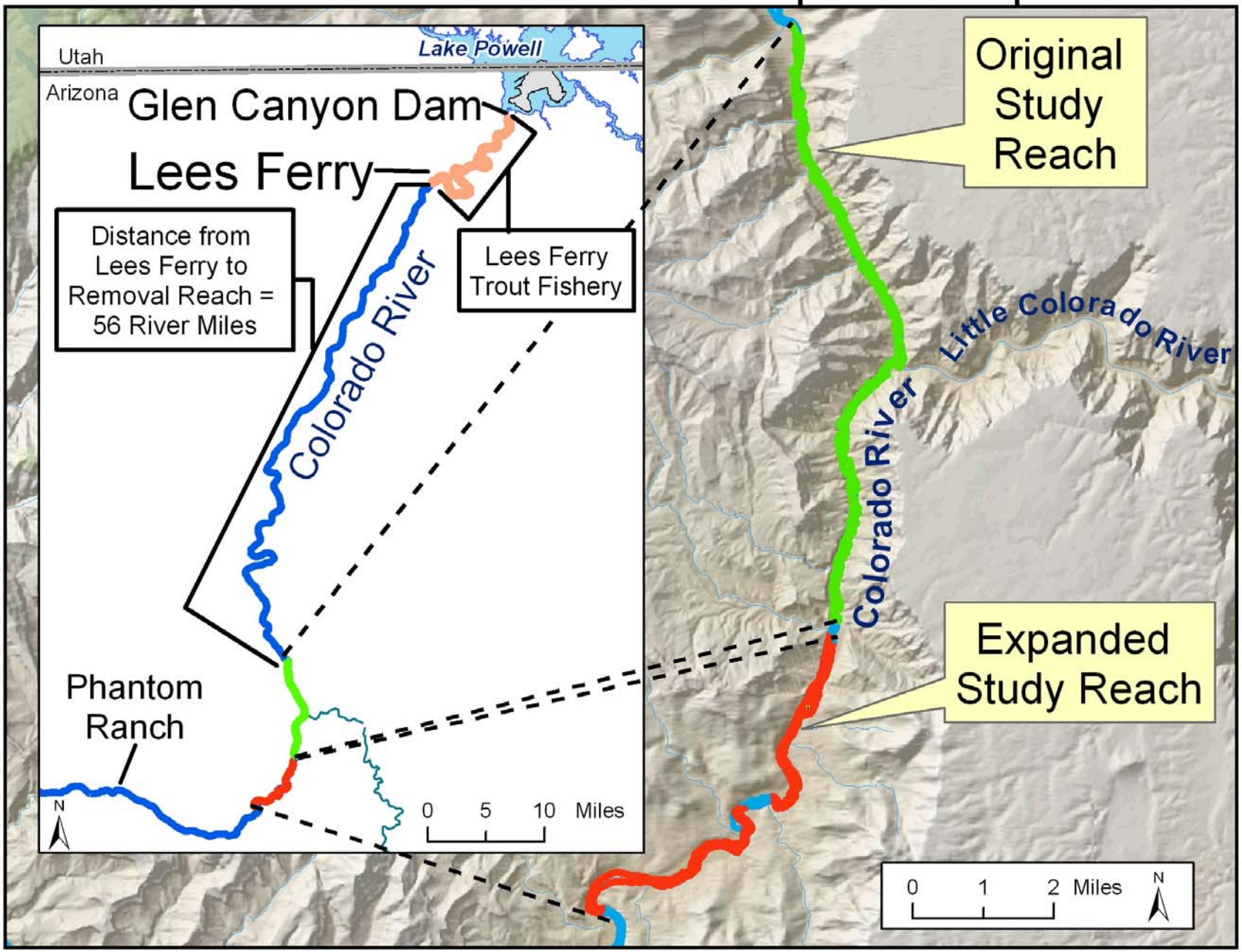
- Diet analyses still ongoing but results thus far indicate low rate of piscivory by RBT and high rate of piscivory by BNT.

- Hoopnet catches of HBC may indicate a habitat/survival response by HBC following non-native removal.

Proposed Modification

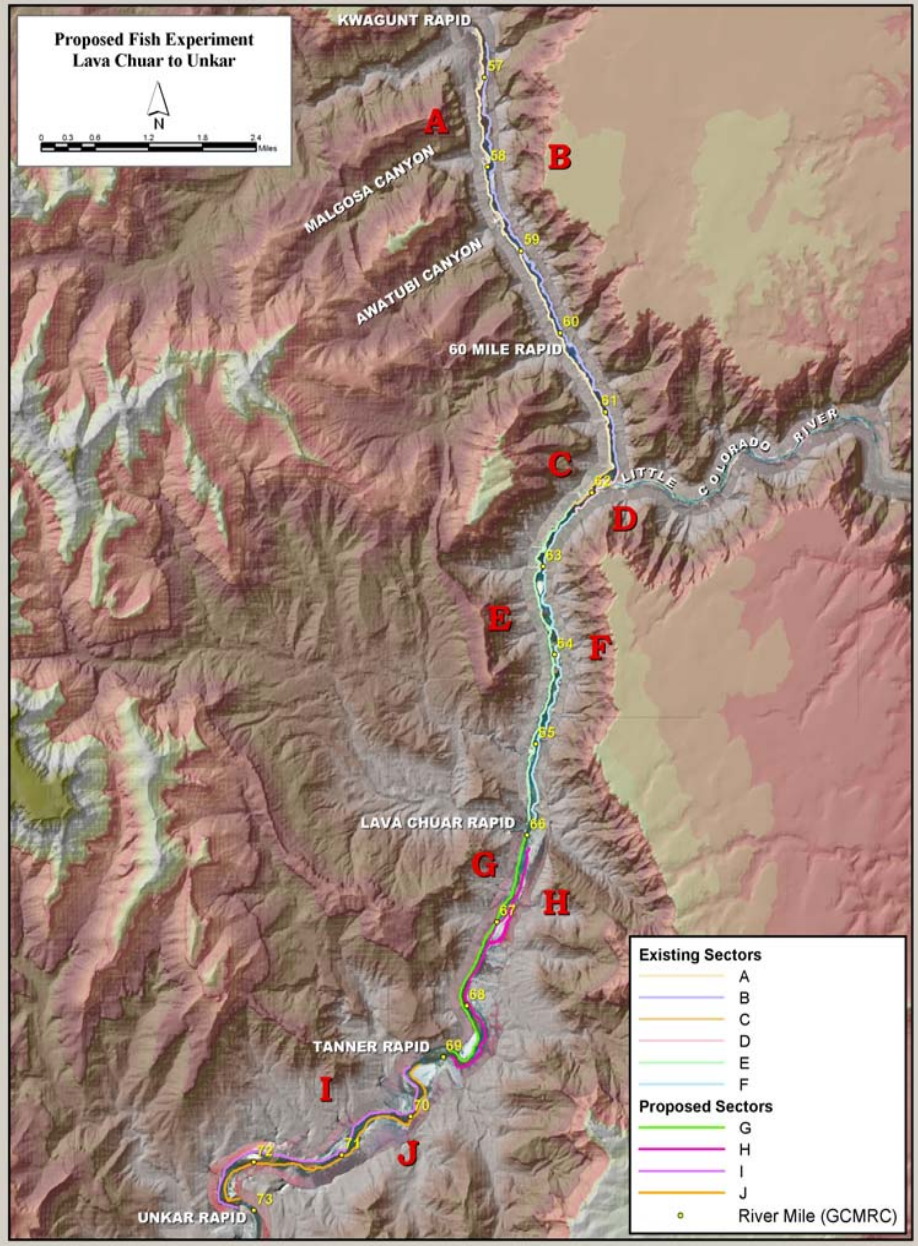
- Prompted by the greater than expected efficacy of non-native removal, we suggest expanding the geographic scope of removal area downstream an additional 7 miles.
  - Allow for a greater treatment magnitude.
  - Potentially result in greater ability to detect change in HBC population dynamics as a result of non-native removal.
  - Additional HBC monitoring opportunities.

Non-Native Fish Removal - Proposed Expansion



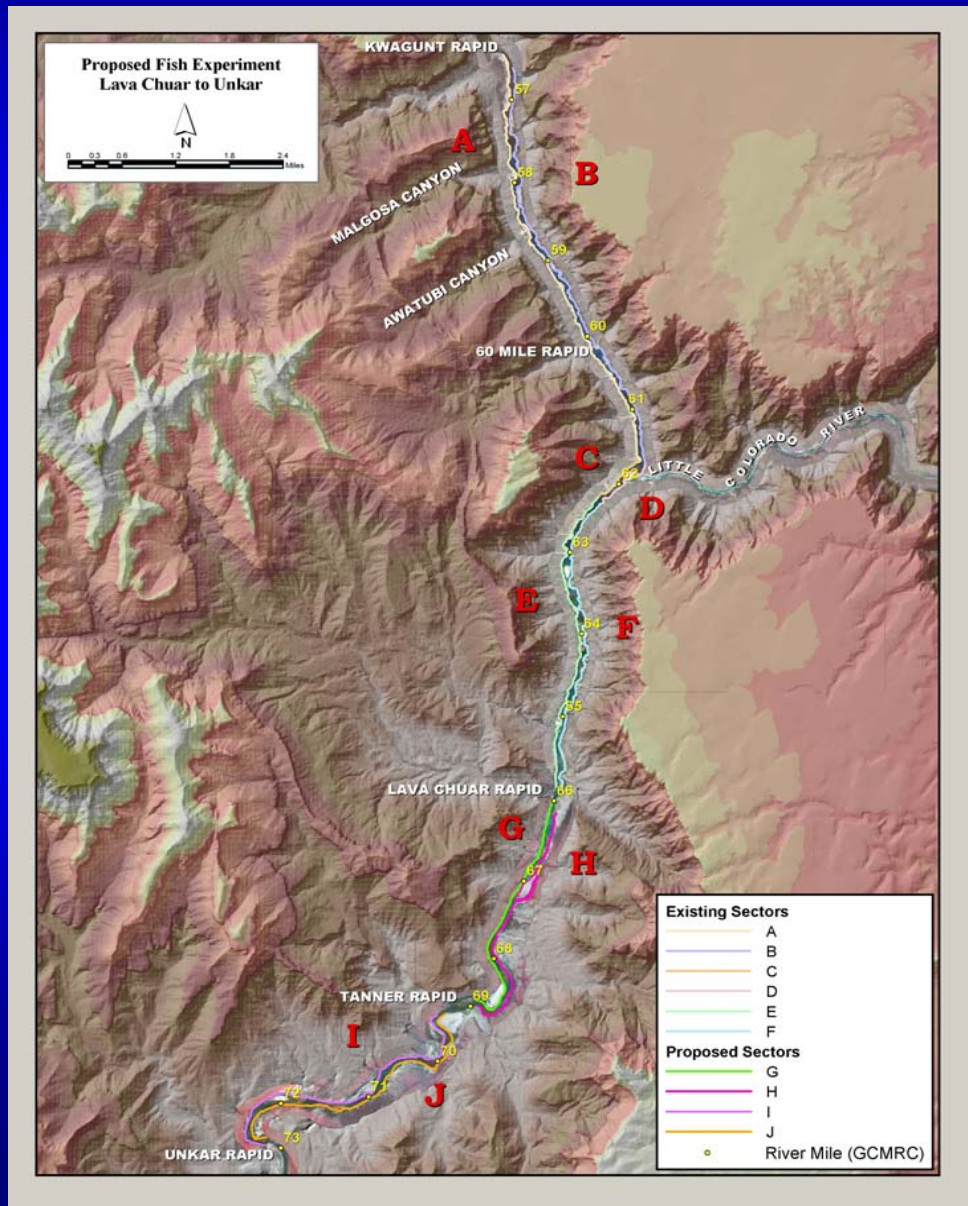
Proposed Modification – Why??

- The motivation to modify the study is to increase the magnitude of the treatment in order to have the best chance of obtaining an unambiguous experimental result.
- Why will this help?
  - Will affect a larger portion of the area where HBC and non-natives are believed to interact (Greater treatment magnitude, increased survival of juveniles).
  - Will potentially provide a greater likelihood that the HBC stock assessment program will detect a change.
  - Will allow a more robust (time and area) sampling program of relative abundance (hoopnetting).



We will affect a larger portion of the area where HBC and non-natives are believed to interact (increased survival of juveniles).

- Current paradigm of LCR HBC juvenile recruitment is:
  - Larval HBC emerge in the late Spring-early Summer.
  - Some proportion of the juveniles rear in the LCR, the rest move to the mainstem Colorado (YOY during monsoon, 1+ juveniles during spring runoff).
  - Most if not all of the juvenile HBC transported to the mainstem do not survive. Majority of recruitment coming from LCR rearing.



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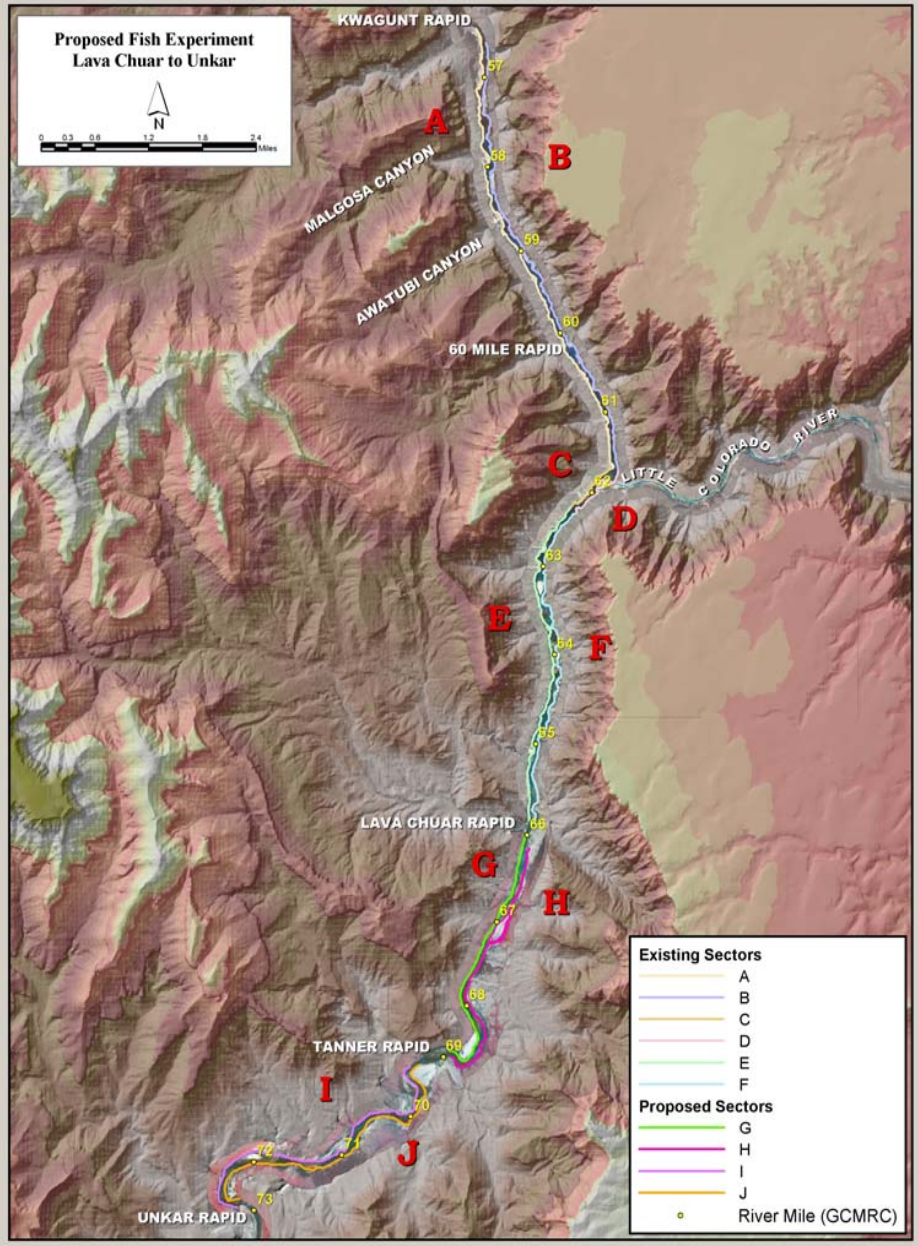

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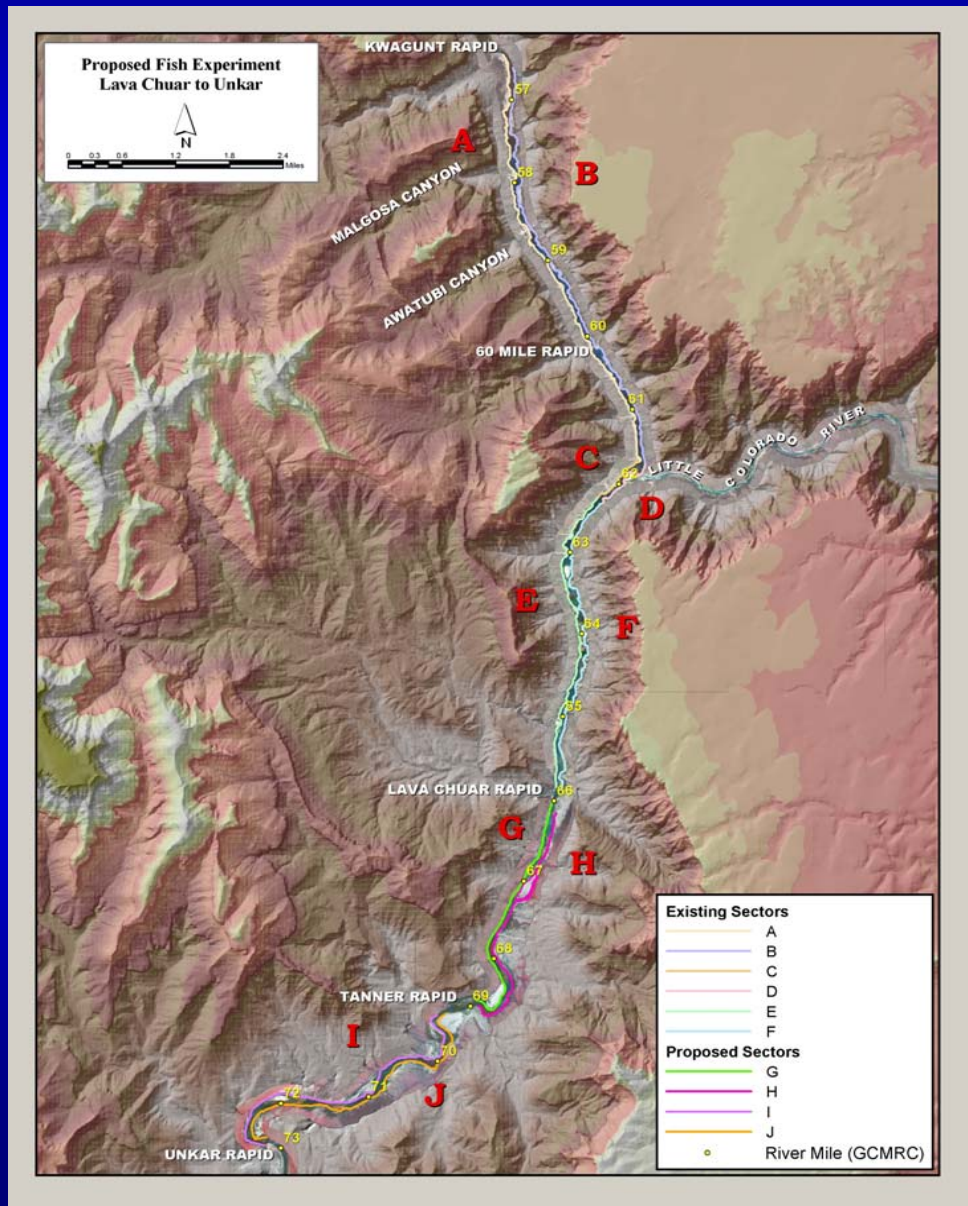
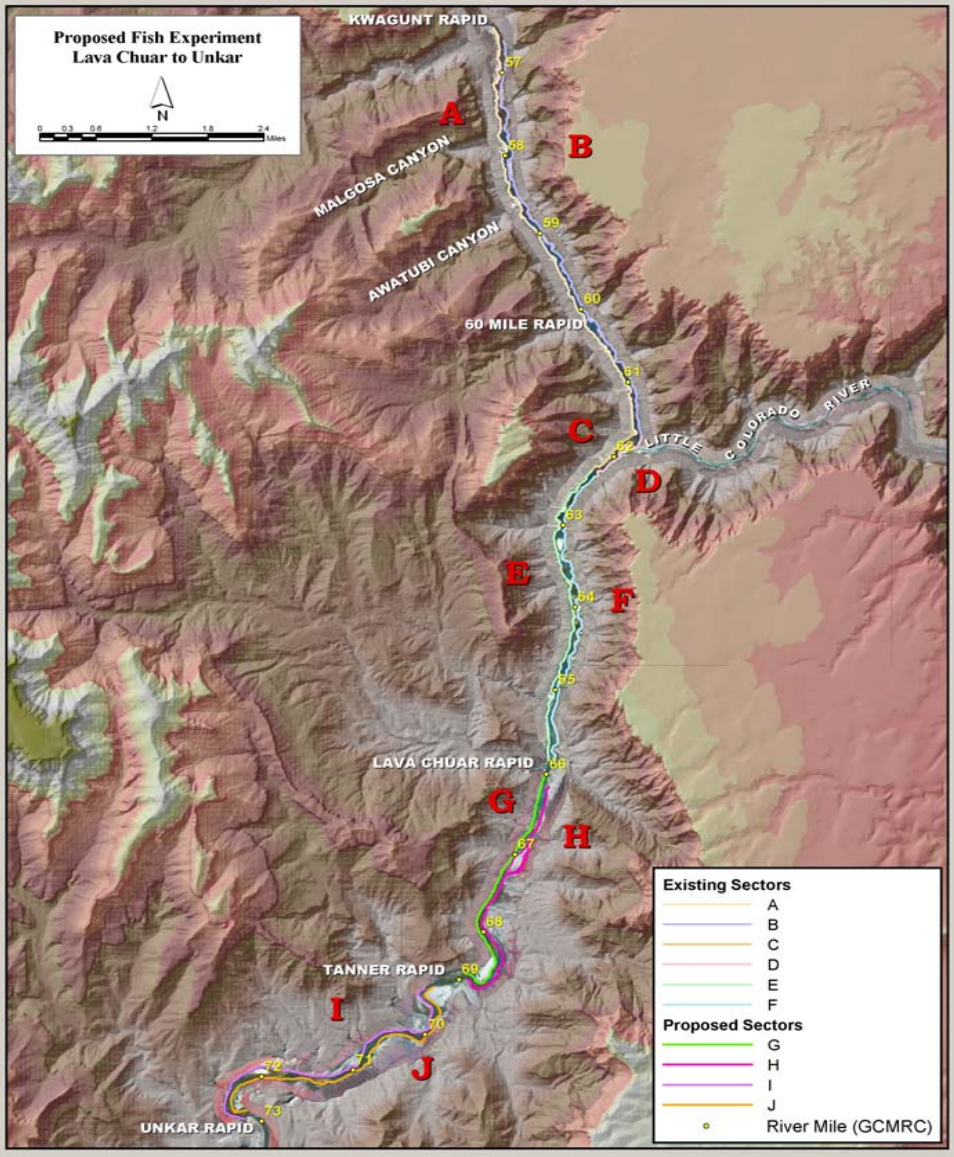
  - Larval HBC emerge in the late Spring-early Summer.
  - Some proportion of the juveniles rear in the LCR, the rest move to the mainstem Colorado (YOY during monsoon, 1+ juveniles during spring runoff).
  - Most if not all of the juvenile HBC transported to the mainstem do not survive. Majority of recruitment coming from LCR rearing.



Proposed Modification

Will provide about the same geographic extent of predator free habitat in the mainstem as is available in the LCR.

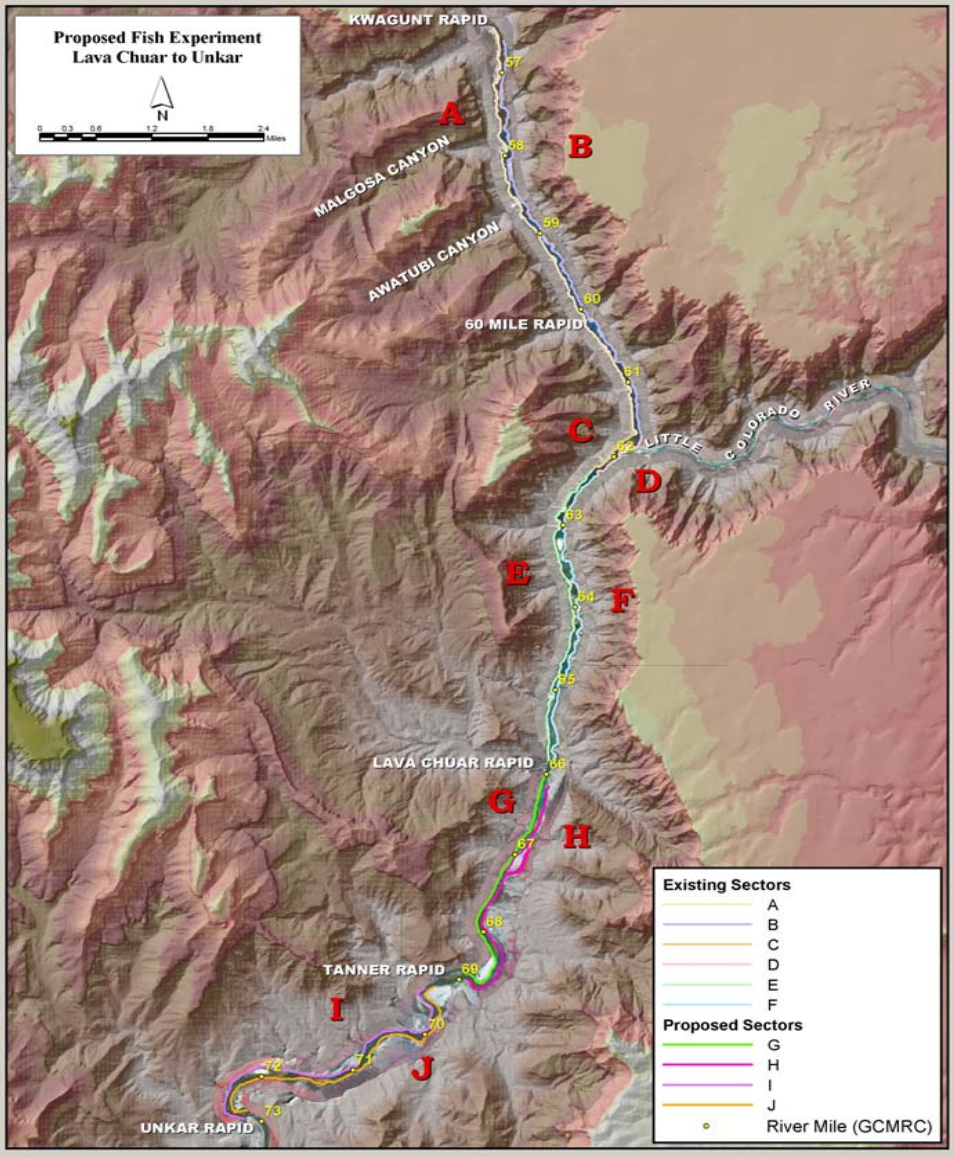
If need ½ as much recruitment out of the mainstem as the LCR, need to make abundant rearing habitat in the mainstem.



Proposed Modification

Will provide about the same geographic extent of predator free habitat in the mainstem as is available in the LCR.

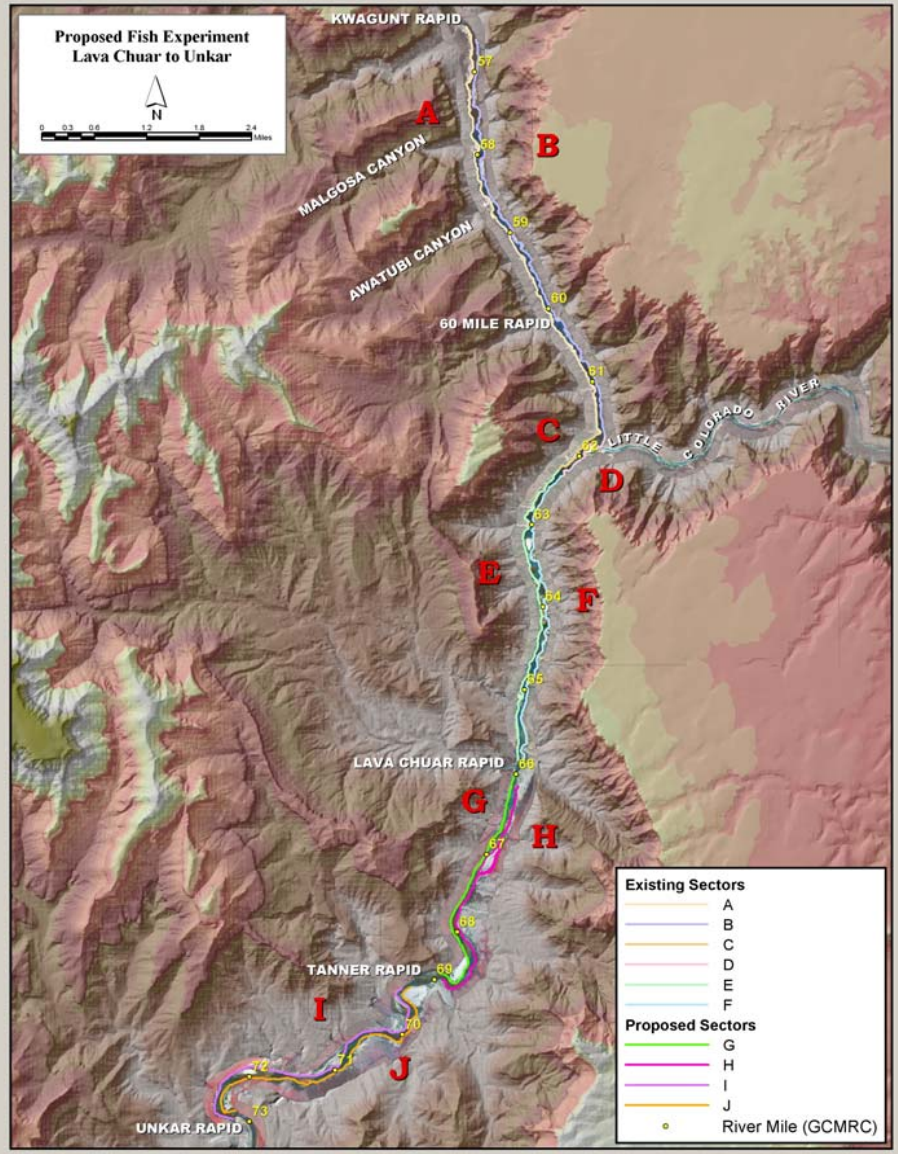
Stock Assessment Model simulations indicate an increase in recruitment of HBC of >50% will be needed to reliable detect change.



When Would The Proposed Removal Begin?

- Removal within the proposed reach would begin only if July or later sampling efforts suggest that the abundance within the removal reach is less than or equal to that observed following the March trip (>88% reduction)

- Assuming confirmation that the abundance in the original removal reach is low:
  - Removal within the proposed reach would proceed during August and September.



AMWG HBC AdHoc & TWG Support

- Presentation of proposed modification made to HBC Ad Hoc meeting on April _____
  - Ad Hoc Endorsed Proposed Change
- Presentation of proposed modification made to TWG meeting on 6/30-7/1/03
  - TWG Concurred with Ad Hoc Action and Recommended AMWG Conference Call to Address Proposed Changes for FY03 Prior to August 13-14, 2003 Meeting

Budget Implications

- Cost of Current Effort Underway for FY03 is $650,000
- Proposed Change Results in No Additional Cost for FY03 or FY04
- Potential Cost Savings If FY03 Scope of Work Was Reduced Are Difficult to Estimate But Would Probably Be Less Than 10% of FY03 Project Cost

Compliance Issues

- Proposal Describing Modification of Project Developed by GCMRC in May, 2003
- Discussions Held in May Between GCMRC & Representatives from Native American Tribes-Concurrence & Support Expressed
- Modified AZ Game & Fish Dept Scientific Collection Permit Sought and Obtained by GCMRC

Compliance Issues continued…

- National Park Service Permit Modification Applied for By GCMRC in Early June
- Request to Reinitiate Consultation Under Section 7 of the ESA Sent to USFWS in Early June

Compliance Issues continued …..

- Amendment to NEPA Environmental Assessment Document Prepared and Issued for Public Review - Comments Must Be Postmarked August 8th. Decision Anticipated on or before August 12th.

Upcoming Trip Schedule

- August 2003 Trip Launches August 13th and Ends (Takeout) August 29th
  - 1 week turnaround time between trips
- September 2003 Trip Launches September 10th (6 days before end of motorized season) - Trip Ends Sept 26th
  - Probable overlap with non-motorized boaters of 2-3 days

JULY TRIP PRELIMINARY RESULTS

- 2,300 Rainbow Trout Removed
- Equivalent To February, 2003 Catch
- Indicates Immigration Occurring Into Removal Reach
- No Implication for Proposed Modification
  - Indicates Flexible Allocation of Removal Effort As Described in Proposal For Modification

Action Agencies (USBR,NPS,USGS) Request AMWG Approval of Proposed Modification for August & Sept. 2003 Modified Trips

Necessary to:

Finalize All Compliance Issues in Time for Expansion of August-Sept Non-Native Removal Efforts to Occur

August 13-14, 2003 AMWG Meeting

Full Discussion and Action Regarding Continuation of Modified Proposal in FY04

THANKS !

QUESTIONS & ANSWERS