

**United States Department of the Interior
U.S. Fish and Wildlife Service
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AESO/SE
02-21-03-F-0016 -R1

August 12, 2003

Memorandum

To: Regional Director, Bureau of Reclamation, Salt Lake City, Utah
Superintendent, Grand Canyon National Park, Grand Canyon, Arizona
Superintendent, Glen Canyon National Recreation Area, Page, Arizona
Chief, Grand Canyon Monitoring and Research Center, USGS, Flagstaff, Arizona

From: Field Supervisor

Subject: Reinitiation of Section 7 Consultation on Proposed Experimental Releases from Glen Canyon Dam and Removal of Non-native Fish

Thank you for your June 18, 2003, request for reinitiation of formal consultation with the U.S. Fish and Wildlife Service pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). You have requested this reinitiation to make a change to the proposed action considered in the original biological opinion to increase the geographic scope of ongoing removal of non-native fish in Grand Canyon and the possible effects to the humpback chub (*Gila cypha*, hbc) and the bald eagle (*Haliaeetus leucocephalus*). The purpose of non-native fish removal, as identified in the original consultation, is to improve critical habitat and provide a better understanding of the interactions between non-native fishes and native fishes, in particular, hbc. The change would consist of extending the original non-native fish removal reach from river miles 56.2 to 65.7 to river miles 56.2 to 72.7, including additional monitoring of hbc, and minor changes in scheduling of river trips to accommodate these changes. You are requesting the change because the unanticipated high level of efficacy of your non-native fish removal efforts has provided an opportunity to modify the original proposal within your existing program (your preliminary results suggest that over 80 percent of non-native brown trout (*Salmo trutta*, bnt) and rainbow trout (*Oncorhynchus mykiss*, rbt) have already been removed from the experimental reach after only 3 of 12 planned removal trips. The change should result in an experimental treatment of greater magnitude, provide less ambiguous results, and result in a lower probability of adverse effects to hbc from the experiment due to electrofishing.

The original biological opinion, dated December 6, 2002, concerned the possible effects resulting from experimental flows from Glen Canyon Dam, and from mechanical removal of rbt and bnt,

and other non-native fishes from the Colorado River above and below its confluence with the Little Colorado River (LCR). In the original opinion, you determined that the proposed project was likely to adversely affect hbc and its critical habitat, the Kanab ambersnail (*Oxyloma haydeni kanabensis*), and the bald eagle. You also determined that the proposed project “may affect, but is not likely to adversely affect” the razorback sucker (*Xyrauchen texanus*) and its critical habitat, southwestern willow flycatcher (*Empidonax trailli extimus*), and the California condor (*Gymnogyps californianus*); concurrences for these species were provided in Appendix A of the original biological opinion. This reinitiation only addresses the hbc and bald eagle. All effects to the Kanab ambersnail, razorback sucker and its critical habitat, southwestern willow flycatcher, and California condor remain the same as described in the 2002 biological opinion.

The joint leads for this project are Reclamation, Glen Canyon National Recreation Area and Grand Canyon National Park, and the U.S. Geological Survey’s Grand Canyon Monitoring and Research Center (GCMRC).

This biological opinion was prepared using the September 2002 Environmental Assessment (EA), titled: “Proposed Experimental Releases from Glen Canyon Dam and Removal of Non-native Fish;” the December 6, 2002, biological opinion; the GCMRC proposal, “Non-native Fish Removal Efforts in Grand Canyon: A Proposed Modification to Ongoing Activities”; telephone conversations; information provided by Reclamation and GCMRC staff; and our files. A complete administrative record for this consultation is on file in our office.

CONSULTATION HISTORY

- In our December 6, 2002, biological opinion, we found that the proposed action was not likely to jeopardize the continued existence of hbc, the Kanab ambersnail, or bald eagle, or adversely modify critical habitat for hbc.
- March 27, 2003, Reclamation requested reinitiation of formal consultation on proposed changes in the conservation measure to translocate hbc above Chute Falls.
- On June 10, 2003, Lew Coggins of GCMRC gave a presentation to the Humpback Chub Ad Hoc Group of the Adaptive Management Program (AMP) on a proposal to modify ongoing non-native fish removal efforts in the Grand Canyon.
- June 12, 2003, we issued a non-jeopardy biological opinion on the reinitiation to change the conservation measure for the translocation of hbc above Chute Falls.
- June 18, 2003, GCMRC requested reinitiation and provided as an attachment the proposal “Non-native Fish Removal Efforts in Grand Canyon: A Proposed Modification to Ongoing Activities.”
- On June 30, 2003, Steve Gloss gave a presentation about the proposed non-native fish removal modification to the Technical Work Group (TWG) of the AMP. The TWG

approved a motion to recommend to the Adaptive Management Workgroup that the modification be implemented.

- On August 8, 2003, the Adaptive Management Work Group held a conference call to discuss the proposed non-native fish removal modification. A consensus was reached among members on the call that the proposed modification should be implemented.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action remains the same as described in our December 19, 2000, biological opinion, with the exception of the following:

The action agencies will continue to remove non-native fishes (primarily salmonids) from the LCR Inflow Removal Reach (RM 56.2 - 65.7) through the use of a series of depletion trips where non-native fishes are captured using electrofishing methods, euthanized, and removed from Grand Canyon for use as fertilizer by the Hualapai Nation. The original proposal included a total of 12 depletion river trips, 3 winter trips in January, February, and March, and 3 summer trips in July, August, and September during 2003 and 2004. The 2003 January, February, March, and July trips have been completed. Subsequent trips will utilize an expanded removal reach. This expanded removal reach will include an additional 7 miles down stream (Lava Canyon Rapid to Unkar Rapid), extending the total length of the removal reach to 16.5 miles (RM 56.2 - 72.7).

The proposed sampling design for all future trips would retain the established control reach (RM 56.2 - 65.7) using electrofishing to measure relative abundance and marking rbt (i.e., Floy-tags, catch and release) for determining downstream emigration rates and system-wide population changes. This sampling effort would consist of one-night time period using four electrofishing boats. For the August and September 2003 trips, one or two depletion pass efforts would be conducted in the LCR Inflow Removal Reach (RM 56.2- 65.7, the original depletion reach) using four electrofishing boats over a two to four-night sampling period. Following this sampling effort, a series of three or four single-pass electrofishing depletions would be conducted in the proposed extension depletion reaches, referred to as the Lava Canyon-Tanner Depletion Area (RM 65.7 - 68.5), and Tanner-Unkar Depletion Area (RM 68.5 - 72.7).

Overall, the goal would be to reduce non-native fish abundance within the entire removal reach to 10 percent or less of the initial abundance (i.e. the target treatment level) for the term of the experiment, while minimizing the amount of native fishes exposure to electrofishing. Therefore, to monitor efficacy of depletion efforts, depletion estimates would be conducted in all 3 removal reaches during the first winter trip of 2004 (January) and during the first summer trip of 2004 (July). Three electrofishing depletion passes would be conducted in each reach. The necessity for additional winter and summer trips and reaches to be sampled would be based on predicted effort needed to maintain the target treatment level within each of the three reaches based on these depletion trips.

Hoop net sampling would be continued as a method for assessing relative abundance of hbc young of the year in the Colorado River main stem. Hoop net sets in the LCR Inflow Removal Reach (RM 56.2- 65.7) would continue each trip as in the original proposal. New hoop net sampling sites, similar to those in the original proposal (30 hoop nets, set for 3 24-hour sets) would be established at the Lava Canyon-Tanner Depletion Area (RM 65.7 - 68.5) and Tanner-Unkar Depletion Area (RM 68.5 - 72.7). These hoop net sets will be set while conducting electrofishing depletion passes in the adjoining depletion reach (e.g. hoop nets will be set in the Tanner-Unkar reach while depletion passes are being conducted in the Lava Canyon-Tanner Depletion Area). The increased hoop-netting effort will increase hoop net sample size, and help determine local and overall response changes (relative abundance, dispersal rates, and over-wintering survival) across multiple sampling sites.

All non-native fish stomach samples will continue to be assessed for incidence of predation, and a percentage of these samples are to be evaluated for specific diet. Additionally, drift and benthic samples will continue to be collected in upstream and downstream reaches to determine how different trout species are tracking food resources relative to their availability.

STATUS OF THE SPECIES

The status of the species remains the same as described in the 2002 biological opinion.

ENVIRONMENTAL BASELINE

The environmental baseline remains basically the same as described in the 2002 biological opinion. Research and monitoring continues, including experimental flows and non-native fish removal, and translocation of hbc above Chute Falls is scheduled to take place later this summer, as outlined in the original biological opinion and the June 12, 2003, reinitiation.

The results of sampling trips completed for this project thus far have resulted in a total combined mortality of 4 hbc (L. Coggins, GCMRC, pers. comm. 2003). A total of 125 hbc have been captured via electrofishing, ranging from 50-446 mm total length (TL), although most of these were less than 200 mm TL. Hoop netting efforts resulted in capture of 143 hbc of approximately equal numbers of 50-100 mm and 100-200 mm TL hbc (L. Coggins, GCMRC, pers. comm. 2003).

Mechanical non-native fish removal efforts in the LCR Inflow Removal Reach in January, February, and March 2003 have been extremely successful: 135 common carp have been removed (average removal efficiency of 73 percent), 130 bnt have been removed (average removal efficiency of 48 percent), and 6,703 rbt have been removed (average removal efficiency of 60 percent; Coggins and Yard 2003). Approximately 2300 rbt were removed in July 2003 (L. Coggins, GCMRC, pers. comm. 2003).

EFFECTS OF THE ACTION

The effects of the action remain the same as described in the 2002 biological opinion, except for the following:

Humpback chub and its Critical Habitat

As in the original biological opinion, the effects to hbc from the proposed modification will be predominantly from electrofishing and hoop netting capturing and handling stress. The proposed modification will continue these activities in the original 9.5 mile long LCR Inflow Removal Reach, and will extend these activities over an additional 7 miles from Lava Canyon to Unkar Rapids. The effects of electrofishing, include electrofishing narcosis and/or tetney, immobilization, rigid muscles, and altered breathing. The LCR Inflow Removal Reach is recognized for having the highest abundance of adult and juvenile hbc in the Colorado River main stem (Valdez and Ryel 1995). Hbc are less common in the Lava Canyon-Tanner and Tanner-Unkar Depletion areas than in the LCR Inflow Removal Reach (Yard and Coggins 2003). Although the geographic extent of the proposed modification will be increased by 7 miles, the amount of electroshocking should be similar to the original proposal; approximately 125 hours of electrofishing per trip. GCMRC estimates that due to the reduced abundance in the proposed removal reach, fewer hbc will be captured, because effort will be concentrated in the new reach where hbc are less common (Tables 1 and 2).

Table 1. Electrofishing passes in the original and proposed reaches for each of the remaining trips. The number of passes in each reach may be modified based on catch, although total effort among all reaches will not change.

Trip	Control Reach	LCR Inflow Orig.	LCR Inflow Prop.	Lava-Unkar Reach Prop.
2003				
Aug	1	5	1	4
Sep	1	5	1	4
2004				
Jan	1	5	3	3
Feb	1	5	1	4
Mar	1	5	1	4
Jul	1	5	3	3
Aug	1	5	1	4
Sep	1	5	1	4
Total	8	40	12	30

Table 2. Estimated minimum, mean, and maximum anticipated catch of hbc per removal trip assuming 125 hours of electrofishing per trip and recent observed catch-rate.

	Lavar to Unkar Reach Catch		LCR Inflow Reach Catch	
	HBC<200	HBC>200	HBC<200	HBC>200
Minimum	0	0	0	0
Mean	134	0	149	6
Maximum	457	0	1114	70

The proposed modification includes additional hoop netting, 30 24-hour hoop net sets each between Lava Canyon and Tanner rapids and Tanner and Unkar rapids. Previous survey data indicates that this reach has fewer hbc than the LCR Inflow Removal Reach (Valdez and Ryel 1995, Gorman and Coggins 2000), so GCMRC anticipates that likely fewer hbc will be caught in the proposed hoop net sets than the predicted 396.9 hbc per year for hoop nets in the LCR Inflow Removal Reach (L. Coggins, GCMRC, pers. comm. 2003). The level of hoop netting effort in the LCR Inflow Removal Reach would stay the same as in the original opinion (30 hoop nets set for 3 24-hour sets).

Because removal efforts have been so successful, to continue the study as originally proposed would likely not result in significant gains in non-native fish removal, and may subject hbc to needless adverse affects from electrofishing oversampling. Alternatively, by extending this work downstream, additional benefits may be conferred to hbc by increasing the efficacy of non-native removal over a greater geographic extent, while reducing the overall potential for adverse effects to hbc from the project. Critical habitat for hbc will also benefit. The primary constituent elements of critical habitat include the biological environment. Competition and predation, otherwise normal components of the biological environment, are out of balance because of the presence of large numbers of non-native fishes (see 59 FR 13378). This project will have a beneficial effect on critical habitat by restoring, to some degree, the native biological environment.

Bald Eagle

As identified in the original biological opinion, the removal of trout may affect the availability of locally abundant food resources for wintering bald eagles. Wintering bald eagles have been documented foraging on spawning rbt in tributaries of the Colorado River in Grand Canyon, with a concentration at the mouth of Nankoweap Creek (Brown *et al.* 1989), which is approximately 3 miles upstream of the start of the LCR Inflow Removal Reach at Kwagunt Rapids. However, when trout are less abundant in Grand Canyon, bald eagles appear to utilize other resources in the area (G. Beatty FWS pers. comm. 2003, van Riper *et al.* 1995). Because the depletion reach proposed in this modification would be approximately 13 miles downstream of Nankoweap Creek, trout removal in the new depletion reaches will likely result in only a small additional

reduction in trout numbers at Nankoweap. Mechanical removal of trout has been successful in removing salmonids in the Colorado River (Coggins and Yard 2003), so there are likely less trout available to bald eagles as a result of this project. Bald eagles may continue to feed opportunistically in the project area, although wintering bald eagles are not likely to remain in areas with reduced food resources (van Riper *et al.* 1995). There are several alternative places for bald eagles to winter in Arizona and a reduction in numbers of trout in the action area may change local feeding opportunities but is not likely to result in significant effects to any bald eagles.

Cumulative Effects

Cumulative effects are those adverse effects of future non-Federal (State, local, government, and private) actions that are reasonably certain to occur in the project area. Future Federal actions would be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project. Effects of past Federal and private actions are considered in the Environmental Baseline. The analysis of cumulative effects remains unchanged from the 2002 biological opinion.

Conclusion

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed implementation of the experimental releases from Glen Canyon Dam and removal of non-native fish, and the cumulative effects, it is the FWS's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the hbc and bald eagle. Critical habitat for the hbc will not be destroyed or adversely modified. No critical habitat is currently designated for the bald eagle, thus none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described are non-discretionary, and must be undertaken by the action agencies so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The action agencies have a continuing duty to regulate the activity covered by this incidental take statement. If the action agencies (1) fail to assume and implement the terms and conditions or (2) fail to require field crews to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the action agencies must report the progress of the action and its impact on the species to the Fish and Wildlife Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

In the original biological opinion, we anticipated the total level of incidental take of hbc would be difficult to detect because of the difficulty in finding dead or injured fish. Hbc will continue to be captured via hoop netting in the LCR Inflow Removal Reach, and additional hbc will be captured during proposed hoop netting from Lava Canyon to Unkar rapids. The level of electroshocking effort over the remainder of the project will increase slightly, however, overall catch of hbc from electrofishing is expected to decrease as a result of the proposed shift in effort downstream to areas of reduced hbc abundance. The incidental take is expected to be in the form of collect, harass, and kill. Most of the take is expected to be in the non-lethal form of collection and harassment. We anticipate 20 hbc will be killed as a result of this action over the remainder of the two year term of this project.

We do not anticipate incidental take of bald eagles as a result of the proposed modification.

EFFECT OF TAKE

The effect of take remains the same as described in the 2002 biological opinion.

REASONABLE AND PRUDENT MEASURES

The reasonable and prudent measures remain the same as described in the 2002 biological opinion.

TERMS AND CONDITIONS

The terms and conditions remain the same as described in the 2002 biological opinion.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 West Broadway Road #113, Mesa, Arizona (telephone: (480) 967-7900) within three working days of its finding. Written notification must be made

within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted to educational or research institutions holding appropriate State and Federal permits. If such institutions are not available, the information noted above shall be obtained and the carcass left in place.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution prior to implementation of the action. Injured animals should be transported to a qualified veterinarian by a qualified biologist. Should any treated listed animal survive, FWS should be contacted regarding the final disposition of the animal.

CONSERVATION RECOMMENDATIONS

The conservation recommendations remain the same as described in the 2002 biological opinion.

REINITIATION NOTICE

This concludes this reinitiation of formal consultation on the proposed action. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your efforts to identify and minimize effects to listed species from this project. For further information please contact Glen Knowles (x233) or Debra Bills (x239). Please refer to the consultation number, 02-21-03-F-016 in future correspondence concerning this project.

/s/ Steven L. Spangle

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
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Director, Bureau of Indian Affairs, Phoenix AZ
San Juan Southern Paiute, Tuba City, AZ
Pueblo of Zuni, Zuni, NM
Havasupai Tribe, Supai, AZ
Hualapai Nation, Peach Springs, AZ
Southern Paiute Consortium, Fredonia, AZ
Hualapai Fish and Wildlife, Peach Springs, AZ
Hopi Nation, Kykotsmovi, AZ
Clayton Palmer, Western Area Power Administration, Salt Lake City, UT

Literature Cited

- Brown, B.T., R. Mesta, L.E. Stevens, and J. Weisheit. 1989. Changes in winter distribution of bald eagles along the Colorado River in Grand Canyon, Arizona. *Journal of Raptor Res.* 23:110-113.
- 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. A report to the Glen Canyon Dam Adaptive Management Program by the Southwest Biological Science Center, U.S. Geological Survey, Flagstaff, Arizona. 41 pp.
- Gorman, O.T. and L. Coggins. 2000. Status and trends of native and non-native fishes of the Colorado River in Grand Canyon 1990-2000. Final Report, U.S. Fish and Wildlife Service, Flagstaff, Arizona.
- Valdez, R.A. and R.J. Ryel. 1995. Life History and ecology of the humpback chub (*Gila cypha*) in the Colorado River, Grand Canyon, Arizona. Final Report to Bureau of Reclamation, Salt Lake City, Utah. Contract No. 0-CS-40-09110. BIO/WEST Report No. TR-250-08. 286 pp.
- van Riper, C., M.K. Sogge, and T.T. Tibbetts. 1995. Wintering Bald Eagles Along the Colorado River Corridor. Pages 20-22 *in* LaRoe, E.T., G.S. Farris, C.E. Puckett, P.D. Doran, and M.J. Mac, eds., *Our living resources: a report to the nation on the distribution, abundance, and health of U.S. plants, animals, and ecosystems*. U.S. Department of the Interior, National Biological Service, Washington, DC. 530 pp.
- Yard, M. and L. Coggins. 2003. Non-native fish removal efforts in Grand Canyon: a proposed modification to ongoing activities. USGS Southwest Biological Science Center Grand Canyon Monitoring and Research Center. 17 pp.