



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES
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2-21-91-F-483

September 13, 1991

Memorandum

To: Regional Director, National Park Service, San Francisco, CA

From: Acting Field Supervisor

Subject: Biological Opinion - Issuance of a Permit to U.S. Fish and Wildlife Service Personnel to Collect Humpback Chubs and Razorback Suckers in the Grand Canyon National Park, Coconino County, Arizona

Introduction

This memorandum responds to your request dated August 12, 1991, for formal consultation pursuant to the Endangered Species Act of 1973 (ESA), as amended, on the proposed issuance to Fish and Wildlife Service's (FWS) Fisheries Assistance Office and Cooperative Fish and Wildlife Research Unit personnel (applicant) of a National Park Service (NPS) permit to collect endangered humpback chubs (Gila cypha) and proposed endangered razorback suckers (Xyrauchen texanus) in the Little Colorado River and other tributaries to the Colorado River in Grand Canyon National Park (Park). Your request was received on August 22, 1991.

The following biological opinion is based on information provided by the applicant in their study proposal submitted for the permit application, the technical study proposal to Glen Canyon Environmental Studies (GCES), data in FWS files including the Endangered Species Subpermit, and discussions with biologists knowledgeable about the species. Telephone discussions with the applicant on September 11, 1991, resulted in the agreed upon modification of their action from that originally submitted to the NPS.

BIOLOGICAL OPINION

It is my biological opinion that the issuance of the proposed NPS permit to the applicant is not likely to jeopardize the continued existence of the humpback chub, but will promote the conservation of the species.

BACKGROUND INFORMATION

Species Description

The humpback chub was listed as endangered by the FWS on March 11, 1967. No critical habitat has been designated for the species. The humpback chub is one of the "big river" fish endemic to the Colorado River Basin that has become very reduced in abundance and occurrence. The species is currently found in the Colorado, Little Colorado, Green, and Yampa Rivers. The Grand Canyon population of the Colorado and Little Colorado Rivers is the largest. The decline of the species may be due to a combination of factors such as: stream alteration (dams, irrigation, dewatering, channelization, habitat fragmentation), competition with and predation by introduced nonnative fish species, and pollution.

The humpback chub is an unusual and striking fish. It is a medium-size (less than 500 mm total length [TL]), freshwater fish of the minnow family (Cyprinidae). Adults generally have a pronounced dorsal hump (Minckley 1973). Further description of the humpback chub can be found in the recently revised Recovery Plan for the species (FWS 1990).

Humpback chubs are found in a variety of habitats; unfortunately, its habitat preferences are poorly understood. Humpback chubs in the lower basin of the Colorado River have been captured in the main channel and tributaries between Lake Powell and Lake Mead. Humpback chubs are known to feed upon chironomid and simuliid larvae and other aquatic and terrestrial insects (Kaeding and Zimmerman 1983).

Site Description

The humpback chub was described from a specimen taken in the Grand Canyon of the Colorado River and two other specimens of unknown origin (Miller 1946). Glen Canyon Dam profoundly changed the seasonal pattern of temperature, sediment, and flow of the Colorado River to one of constant cold, usually clear, and controlled releases. Downstream of Lake Powell, humpback chubs have been collected in the Colorado River from just below Glen Canyon Dam to River Mile 216 (AGFD unpublished data). The species has been collected in five tributaries to the Colorado River in the Grand Canyon; however, successful spawning is known to occur only in the Little Colorado River (LCR), the largest tributary (Kaeding and Zimmerman 1983; Maddux et al. 1987).

The study area includes the perennial, lower 21 kilometers (km) of the LCR, from the Blue Springs area to the confluence with the Colorado River, and tributaries of the Colorado River in the Park (Paria River and Bright Angel, Shinumo, Tapeats, Deer, Kanab, and Havasu Creeks).

Action Description

Issuance of the permit will allow the applicant to begin a multi-year research study on the ecology and conservation of the humpback chub in the LCR and other tributaries in the Park. This study will be part of the endangered and native fish studies identified by an interagency consultation team for Glen Canyon Dam as one of the conservation measures that would lead to the protection and recovery of the humpback chub in the Grand Canyon. The study will provide information for both the existing formal Section 7 consultation and the Environmental Impact Statement on the operation of Glen Canyon Dam.

The principle investigator for this permit is Dr. O. Gorman, and additional responsible parties from the Pinetop Fisheries Assistance Office include Messrs. J. Hanson, S. Leon, B. Bristow, J. Anderson, A. Laweka, and D. Parker; and from the Arizona Cooperative Fish and Wildlife Research Unit, Dr. O. Maughan and Messrs. A. D' Silva, B. Mattis, and N. Allen.

The purpose of the investigation is to quantify habitat use by juvenile and adult humpback chubs in the LCR and other tributaries in the Park, evaluate the potential for establishing another spawning aggregation, and evaluate the impact of Glen Canyon Dam operations on humpback chub populations in the Park. In addition, this study will evaluate the habitat use by other native and introduced fish species in a community approach that will identify interactions and associations of the various fish species in the common pool of habitats and resources.

The study began in July 1991 and is scheduled to continue through July 1994. Field work will be conducted for one to three week periods on a monthly basis. Schedules of sampling will be adjusted to coincide closely with those of the other humpback chub research projects in the LCR that are being conducted by Arizona Game and Fish Department (AGFD) and Arizona State University (ASU). Activities involving collection of endangered species are presently being coordinated through the above NPS permitted research projects.

Stream habitat will be measured and mapped seasonally, and habitat use by the humpback chub and other fish species will be determined using capture devices (seining, trammel netting, hoop netting, trapping) and direct observation. Fishes captured will be identified and returned to the general vicinity of capture. If necessary, additional LCR sampling effort may be employed in areas not being investigated by the AGFD or ASU. This effort will be coordinated with those researchers and the GCES Aquatic Coordination Team (ACT). In conjunction with that effort, humpback chubs and razorback suckers 150 mm TL or greater will be marked with Passive Integrated Transponder (PIT) tags. This fish size is based on the current advise to the FWS from the ACT.

The applicant proposes to collect a limited series of small, young-of-year native fish species as vouchers to validate their research. The series for humpback chub would include no more than the following purposefully taken specimens: 30 individuals, less than 30 mm TL; 15 individuals, 30-49 mm TL; and 5 individuals, 50-74 mm TL.

In addition to the application for a NPS permit, the applicant has also obtained a scientific collecting permit from AGFD and an endangered species permit from the FWS for their research activities.

IMPACTS OF THE ACTION

Environmental Baseline

The Colorado River in the Grand Canyon has been physically modified by Glen Canyon Dam, as described above in the Site Description, and by the introduction of nonnative fishes beginning in the late 1800's (Gilbert and Scofield) 1898). A jeopardy biological opinion in 1978 on the effects of Glen Canyon Dam on the humpback chub recommended that studies should be conducted to find alternatives that would remove the threat of jeopardy to the humpback chub and lead to the recovery of the species.

Studies, such as Kaeding and Zimmerman (1983) and Maddux et al (1987), have contributed to the knowledge of the humpback chub and have identified the importance of the LCR to the humpback chub. The 1983 study by the FWS referenced above estimated an adult (TL greater than 200 mm) humpback chub population in the LCR of 7,000 to 8,000. Preliminary estimates from AGFD's mark and recapture surveys (May 1987 through 1989) suggest 5,000 to 18,000 humpback chubs use the LCR in the spring season (AGFD 1990).

Direct and Indirect Effects of the Proposed Action

The proposed action is expected to have a positive effect on the survival and recovery of the humpback chub. Beside the purposes stated in the Action Description above, issuance of the proposed permit for research activities on the humpback chub in the LCR will contribute to the following tasks identified in the species' recovery plan (FWS 1990):

4. Investigate the life history and ecological requirements of humpback chub.
 42. Determine habitat requirements.
 421. Determine the biological, chemical, and physical requirements of all life stages.
 422. Determine criteria for identifying suitable and optimal humpback chub habitat.

Capturing, handling, and tagging of humpback chubs, while not expected to result in mortality, will cause some injury and stress, short-term disruption of normal behavior patterns, and local disturbance of habitat due to placement and operation of nets. Stress will be reduced by minimizing the time fish are restrained in the nets. Utmost care will be employed in processing the fish and administering the PIT tag.

Larval fish less than 30 mm TL are difficult to identify to species in the field. Due to the reasonable and not excessive sampling strategies for egg and larval life-stages of fish being employed by researchers in the Park, we have placed no limit on the collection of egg or larval fish for this permit.

The proposed collection of voucher specimens will take (permanently remove) 20 humpback chubs of various size classes (greater than 30 mm TL) as described above in the Action Description. The use of these specimens for other study purposes, such as the AGFD food habit investigations, should be considered if such use does not compromise the primary purpose of the voucher specimens. Upon completion of the studies, the specimens will be deposited in the vertebrate collection at the ASU.

Because this study will be conducted in conjunction with study efforts by the AGFD, ASU, and BIO/WEST, coordination and cooperation among the various research groups will be essential to the successful completion of this study and to the reduction of stress and adverse effects on the fish populations of the LCR.

INCIDENTAL TAKE

Section 9 of the ESA prohibits any taking (harass, harm, hurt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of any listed species without a special exemption. Under the terms of Section 7(b)(4) and 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered taking within the bounds of the ESA provided that such taking is in compliance with the incidental take statement.

Although additional mortality of humpback chub as a result of activities associated with the proposed permit is not expected to occur (beyond that identified in the above Action Description), some incidental mortality may occur during the period of the proposed permit. Incidental take has been estimated from previous experiences employing similar collecting gear.

Based upon review of the permit request and study proposal, the FWS anticipates that up to 5 humpback chub mortalities from each of the following size classes (30-49 mm TL, 50-74 mm TL, 75-99 mm TL, and 100 mm or greater TL) could occur during the period of the permit (total of 20 individuals).

The FWS believes the following reasonable and prudent measures are necessary and appropriate to minimize take:

1. Ensure that all fish collecting and tagging crews are adequately trained for such activities.
2. Handling of humpback chubs will be accomplished in a manner that reduces stress and injury to the fish.
3. The FWS will use the applicants reports, results of the other permit reviews, and the latest estimates of population levels to further evaluate incidental take over the duration of the multi-year study.

In order to be exempt from the prohibitions of Section 9 of the ESA, the following terms and conditions must be complied with in order to implement the above measures:

1. Efficient actions of the processing crew will reduce the time the fish is removed from its environment. Use of PIT tags, which are easily inserted and electronically scanned, will support this condition. Methods of marking humpback chubs less than 150 mm TL will need to be determined later by the FWS with advice from the ACT. The time between examination of an entanglement net (trammel) will not exceed 6 hours, and the time between examination of an entrapment net (hoop or weir) will not exceed 12 hours. Further reduction of these intervals may be necessary during periods of intense humpback chub activity.
2. Trip Reports on a one to two month basis prepared by the applicant shall be sent to the FWS and other members of the ACT, as appropriate. Observations of any adverse effects or unusual condition of the humpback chubs encountered shall be included in the report. The FWS will conduct a review of this permit with the applicant by November 15, 1991. Methods or techniques that would reduce adverse study impacts related to the issuance of this permit for the humpback chub will be solicited from the applicant and other members of the ACT. As necessary, these recommendations will be incorporated as a permit amendment or included in future permits.

If, during the course of the action, the amount of take or extent of the incidental take limit is exceeded, the NPS must reinitiate Section 7 consultation immediately to avoid Section 9 violation. Operations must be stopped in the interim period between initiation and completion of the new consultation if it is determined that impact of the additional taking will cause an adverse impact on the species. An explanation for the causes of the taking should be provided.

PROPOSED RAZORBACK SUCKER

The razorback sucker was proposed as endangered on May 22, 1990. It has been severely reduced to extirpated throughout its range (Colorado River Basin). Since 1984, five individuals were collected in the Grand Canyon (Maddux et al. 1987; AGFD unpublished data). The species' likely listing as an endangered species in 1991 has alerted the ACT for the need to include this species in a rigorous data collection program. Because of the rare occurrence of this species in the Park, take in the form of mortality is not recommended. Presently, the ACT recommends that all razorback suckers be PIT-tagged and that data be collected on the specimens' length, weight, and habitat characteristics similar to that being recorded for the humpback chub. Photographs or video should be taken for each razorback collected because there may be questions regarding hybridization with species such as the flannelmouth sucker (*Catostomus latipinus*). Non-lethal sampling methods should be used to obtain any needed biological materials for taxonomic studies.

CONCLUSION

This concludes formal consultation on this action. Reinitiation of formal consultation is required if the amount or extent of incidental take is exceeded, if new information reveals effects of the action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion, if the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion, or if a new species or critical habitat is designated that may be affected by this action.

If we can be of further assistance, please contact Frank Baucom or Sam F. Spiller, Field Supervisor (602/379-4720 or FTS 261-4720).



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