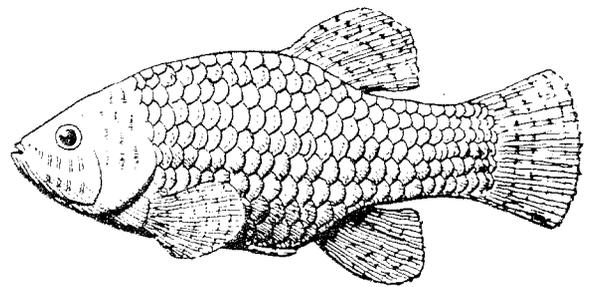


Desert Fishes Council



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20 Aug 1980

MEMORANDUM

From: Wildlife Biologist (Code 26309)
To: Head, Natural Resources Management Office (Code 26309)
Subj: 1980 Mojave Chub Population Census - Lark Seep, NWC

1. INTRODUCTION:

The Mojave Chub (Gila mohavensis) is recognized by both the state and federal government as an endangered member of the minnow family, Cyprinidae. Originally found in the Mojave River from above the junction of the east and west forks downstream to Soda Lake, this unique fish species is now found natively only at Lake Tuendae and nearby Fort Soda (formerly known as the Zzyzx Mineral Springs Resort). It has since been successfully introduced at three other locations in Southern California, one of which is Lark Seep at the China Lake Naval Weapons Center. The original transplant in 1970 of two to three hundred Mojave Chub by the California Department of Fish and Game was made in an attempt to establish a new population of this fish in the seemingly ideal conditions offered at Lark Seep.

From August 4-8, 1980, the NWC Natural Resources Management biologists, comprised of Dianne Beckingham, Karen Karner, Beverly Kohfield, Denise LaBerteaux, and supervisor Tom McGill assisted Department of Fish and Game officials Frank Hoover and Taira Yoshimura from the Chino Fish and Wildlife Base (region 5), in a mark and recapture survey to determine an approximate population estimate of the Mojave Chub in Lark Seep. By conducting such a survey, the California Fish and Game hoped to gain pertinent information indicating the success or failure of the original transplant and thus the overall progress of the project.

2. MATERIALS AND METHODS:

The mark and recapture of Mojave Chub for the four day census was accomplished through the use of thirty-three minnow traps furnished by the Department of Fish and Game. Each trap was composed of two sloping cylindrical sections, framed with quarter inch wire mesh, and separately measuring 8" high, 9" wide at the inside (larger) end, and 7½" wide at the outside (smaller) end. A 5" high cone, complete with 2" round opening, extended from this outside edge into the center (Figure A). These individual sections were fastened together with three interclasping projections to form one complete trap (Figure B).

The minnow traps operate on the simple and effective theory that most fish are capable of finding their way into the funnel-like ends of the trap, but once inside are unable to locate the small entrance leading back to open water.

Bait for each trap consisted of a single 6 oz. can of Petuna brand canned catfood (chopped mackerel), which had been perforated with a can opener at four locations around the lid and placed in the center of the trap. An empty white plastic bottle, tied to a single pin with rope cording, was then attached

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to each baited trap to serve as a float marking location. Each bottle was numbered (1-33) with black waterproof pen for identification. The traps were then submerged at random locations and depths around the seep (Figure C and Table 1).

The trap line was checked for Mojave Chub at regular three hour intervals (average three times daily)*. A five gallon plastic painter's bucket containing shallow water was used to contain captured fish while the sorting and clipping process was accomplished.

It is important to note that there are two species of fish which are known to inhabit Lark Seep: 1) Mojave Chub (Gila mohavensis) and 2) Mosquitofish (Gambusia affinis). The ability to distinguish between the two is essential in order to maintain project accuracy. There are several external features which may be used to effectively differentiate between these two species: the Mojave Chub has a decurved lateral line, a terminal mouth, and a distinctive "hump" behind the head. It may be dusky olive, brown, or brassy on the dorsal surface, and white to silver on the ventral surface. The caudal fin is forked (Figure D). Mosquitofish, in contrast, have an oblique mouth, flattened head, and a dorsal fin located behind the origin of the anal fin. It may be gray or olivaceous dorsally with lighter coloring ventrally. It often gives the appearance of having a distinct "pot belly". The caudal fin is blunt and rounded (Figure E).

The sorting process between species was accomplished after the fish had been taken from the trap and placed in the capture bucket. Mojave Chub were retained in the bucket for marking, while mosquitofish were removed and released back into the seep. The use of an aquarium net was found to be the best method when handling fish, since it avoided direct contact with the body which could result in injury or contamination of the specimen.

The marking of Mojave Chubs was accomplished by clipping the upper or lower tip of the caudal fin with a hole punch. Each fish was then tabulated and released at the point of capture. (Table 2).

3. DISCUSSION

A total of 194 Mojave Chub* were trapped and marked during the course of this four day census. Of these, only 4 of the marked chub were ever recaptured. In lieu of the obvious lack of sufficient recapture data compiled on the total population, it can be surmized that the results therefore obtained from the available figures are insufficient to tabulate an accurate population estimate.

*This figure does not include the 24 fish which died during the census. Water samples taken may indicate a direct correlation between fish mortality and the presence of Sedge (Carex sp.) in the locality of traps where mortality is high.

*The exception to this was the trapping line checked on August 8 which had remained in the water for 36 hours.

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There are, however, some conclusions that can be drawn from the data collected:

A) Most productive trapping locations in view of water depth and available protective cover:

Lark Seep measures approximately 53 cm. at its deepest point. The traps for this census were placed in water depths varying from 21 cm. to 53 cm. The most productive traps were those located close to the shoreline in medium depth water (38.2 cm average depth with most productive trap submerged at 37 cm), near some kind of shelter - either cattail border, dense underwater plant growth, or artificial shelter in that order of preference. Those traps which proved to be least productive were located in open water or in open water with artificial shelter.

B) Most productive trapping times and resulting correlation with water temperature:

The most productive trapping times were found to range, in order of success rate, from 0800 to 1100 (after 12 hours submerged); from 1200 to 1400 (after 3 hours submerged) and finally from 1600 to 1800 (after 3 hours submerged). The success of fish capture during these specific hours may be directly related to and/or affected by water temperature. The water temperature, at those times when trapping proved to be at its highest peak, ranged between 70^o-78^oF. Interestingly enough, the water temperature at Lark Seep usually remained within this range in the morning and early afternoon hours. When water temperature exceeded 80^oF, however, as it usually did in the late afternoon, a rapid drop in fish capture was noted.

C) Average body measurements of trapped Mojave Chub:

A random sampling (136) of captured Mojave Chub from all trapping locations revealed the following results: 38.9% of all captured Chub measured between 2.54 cm - 5.08 cm in length; 32.2% measured between 7.62 cm - 10.16 cm in length; 14.7% measured between 5.08 cm - 7.62 cm in length; 9.5% measured between 10.16 cm - 12.7 cm in length; and 4.4% measured 12.7 cm or larger (largest chub captured measured 20.32 cm in length). This sampling would then suggest that Lark Seep maintains a high population of fry chub, indicating that reproduction has been successful.

Conclusions:

The results from the 1980 chub census clearly indicate that the Mojave Chub refugium located at Lark Seep on the China Lake Naval Weapons Center is an established and thriving habitat for this endangered fish species. This fact is demonstrated by the relatively large number of trapped, unmarked specimens and in the low recapture rate, indicating a large population

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size. To insure the continued success and growth of the population which now inhabits Lark Seep, it is important to maintain and manage the refugium under the cooperative management plans developed by the Department of Fish and Game and the China Lake Naval Weapons Center. In addition to these protective measures, further security patrolling by Code 24 is recommended to prevent vandalism.



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