

NOTES

RESULTS OF MOHAVE CHUB, *GILA BICOLOR MOHAVENSIS*, RELOCATIONS IN CALIFORNIA AND NEVADA

The Mohave chub, listed as an endangered species by both the California Fish and Game Commission and the United States Fish and Wildlife Service, is the only known native fish of Mojave River, California (Hubbs and Miller 1943). Undocumented introduction of the arroyo chub, *G. orcutti* (presence noted by Hubbs and Miller in 1934) and the resultant interspecific hybridization and competition, eliminated the Mohave chub as a distinct species from Mojave River by 1967 (Miller 1967). At that time genetically pure Mohave chubs were known to occur only in two ponds (one being Lake Tuendae) and a drainage ditch at Fort Soda, 13 km southwest of Baker, California (Miller 1967). Concern that the Fort Soda habitat would not be adequately maintained, since it required periodic vegetation removal and pumping of inflow water, efforts to move Mohave chubs to other suitable waters were undertaken. Relocation efforts began in 1967 when the United States Bureau of Land Management, in cooperation with the California Department of Fish and Game, introduced fish from Fort Soda into a small pond at Paradise Spa, Nevada (J. Deacon, Professor, University of Nevada, Las Vegas, pers. commun.). In 1969 and 1970 the California Department of Fish and Game introduced Mohave chubs into a total of three California waters (St. Amant and Sasaki 1971). Eight subsequent introductions were made by the Department from 1971 through 1978 (Table 1).

Two of the 12 introductions led to currently established populations. These include populations in Lark Seep Lagoon, near Ridgecrest, and in a pond at the Desert Research Station, near Barstow, both in San Bernardino County. Surveys in 1979 and 1980 showed an abundance of fish in Lark Seep Lagoon, and a recent population estimate indicates that at least 1,650 fish are present in the Desert Research Station pond.

Additionally important to the status of the Mohave chub, the United States Bureau of Land Management has recently adopted a comprehensive habitat management plan for the Fort Soda population. This plan calls for renovation and enlargement of one of the ponds, installation of back-up pumps for filling Lake Tuendae, and control of aquatic vegetation (Bicket 1978).

The status of the Mohave chub is considerably improved as a result of introductions into additional waters. This lack of urgency now allows relocations to be made more selectively and be restricted to the Mojave River drainage. Although the Mohave chub seems to be adaptable to a variety of situations, more information on habitat requirements of the species is needed to evaluate other potential introduction sites.

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TABLE 1. Results of Mohave Chub Relocations in California and Nevada.

Site	County	Date(s) planted	No. of fish planted	Date(s) surveyed	Population established	Cause of failure of introduction	Date of reintroduction	No. of fish planted	Date(s) surveyed	Current population	Cause of plant failure
Paradise Spa ¹	San Bernardino	June 1967	50	April 1981	No	Unknown	—	—	—	No	—
Plute Creek	San Bernardino	18 and 19 December 1969	150	9 November 1976	Yes	—	—	—	1978 and 1980	No	Flood
South Coast Botanic Garden Pond	Los Angeles	27 January 1970	147	—	Yes	Pond drained ²	20 July 1972; 28 March 1975	55;	1976	No	Unknown
Two Hole Springs	San Bernardino	20 August 1970	41	June 1971	No	Unknown	9 July 1971	105	27 July 1971	No	Unknown
Lark Seep Lagoon	San Bernardino	12 July 1971	400	1979 and 1980	Yes	—	5 November 1976	75	1979 and 1980	Yes	—
Dos Palmas Spring Area:											
Dos Palmas Spring	Riverside	25 May 1972	100	8 January 1980	No	Unknown	—	—	—	No	—
Shrimp Pond	Riverside	25 May 1972	100	8 January 1980	No	Unknown	—	—	—	No	—
Lion Country Safari Ponds	Orange	1 June 1972 and 28 March 1975	822	January 1974	Yes	—	—	—	8 November 1977	No	Unknown
Eaton Canyon Nature Center	Los Angeles	5 June 1972	20	—	No	Unknown	—	—	—	No	—
Busch Gardens	Los Angeles	27 July 1972	49	—	No	Unknown	—	—	—	No	—
Barstow Way Station	San Bernardino	22 July 1975	60	16 September 1976; 1979	Yes	Flood	1 July 1981	30	—	Unknown	—
Lake Norcomian	Riverside	1978	—	6 February and 3 July 1980	No	Unknown	—	—	—	No	—
Desert Research Station	San Bernardino	12 December 1978	16	Continuous	Yes	—	—	—	—	Yes	—

¹ Located in Clark County, Nevada. All other locations listed are in California.

² Fish salvaged and stocked elsewhere.

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of Fish and Game) assisted in field work at Piute Creek. K. Sasaki (California Department of Fish and Game) provided valuable assistance in reviewing the manuscript. Special thanks are due to M. Havelka and the Barstow Unified School District for providing habitat and equipment at the Desert Research Station and for their continuing interest in the species.

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1 Located in Clark County, Nevada. All other locations listed are in California.
 2 Fish salvaged and stocked elsewhere.