

Reprinted from *Archaeological Studies at Oro Grande, Mojave Desert, California*, Carol H. Rector, James D. Swenson, and Philip J. Wilke, eds. (Redlands: San Bernardino County Museum Association, 1983, pp. 169-176).

### Appendix C

## FISH REMAINS FROM THE ORO GRANDE SITE (SBCM-616) ON THE MOJAVE RIVER, SAN BERNARDINO COUNTY, CALIFORNIA

W. I. Follett

This paper discusses fish remains included among the archaeological materials recovered from the Oro Grande site (SBCM-616), in southwestern San Bernardino County, California, during the summer of 1978, by Carol Rector of the University of California, Riverside, and her associates.

The fish remains are deposited in the San Bernardino County Museum.

### THE SITE

The Oro Grande site is located on the west side of the Mojave River about 10 km generally northwest of Victorville and directly across the river from the community of Oro Grande. It is in Section 13, Township 6 North, Range 5 West, San Bernardino meridian (see U. S. Geological Survey, Victorville 7.5' series Quadrangle, 1956).

The site is on the lowermost river terrace, 8 m above the floodplain, at an elevation of 794 m above sea level. The lowermost river terrace is characterized by species of saltbush (*Atriplex* spp.); the floodplain, by Frémont Cottonwood (*Populus fremontii* Wats.) and several willows (*Salix* spp.) (see page 8). The region is within the Lower Sonoran Zone (Grinnell 1935:Pl. 3).

The site is within the territory of the ancestral Vanyume (see Kroeber 1925:614, Pl. 1; Bean and Smith 1978:570, Fig. 1). The environment, archaeology, and ethnography of the site have been summarized by Rector (this volume, pages 5-19).

The fish remains were recovered from a late prehistoric component dated to approximately A.D. 1000 (see pp. 27-31).

### FISH REMAINS

The collection comprises 31 fish remains, most of which are incomplete or fragmentary, representing at least eight fish about 8 to 30 cm in total length and perhaps 5 to 350 g in weight.

## MATERIAL

One basioccipital (incomplete, Fig. 29), two cleithra (1 incomplete, 1 fragment), 17 lower pharyngeals (10 incomplete, 7 fragments; Fig. 30), 11 vertebrae (7 precaudal, 4 caudal; Fig. 31).

Ten of the remains are so nearly complete as to permit a computation of the total length (to the nearest centimeter) of the fish represented by each--by comparison with measurements of a dried skeleton of Mojave Tui Chub (*Gila bicolor mohavensis* [Snyder]), the only fish known to be native to the Mojave River (Calif. Acad. Sci. Cat. No. 26353, total length 126 mm)--as shown in the following table.

Table 14

ESTIMATES OF TOTAL LENGTHS OF FISH  
BASED ON SKELETAL ELEMENTS

<u>Cat. No.</u>	<u>Element</u>	<u>Length (cm) of Fish</u>
56-6081	Lower pharyngeal (left)	8
56-4195	Cleithrum (left)	12
56-5535	Lower pharyngeal (left)	14
56-3632	First vertebra	15
56-3420	Basioccipital	19
56-5824	Lower pharyngeal (right)	19
56-1636	Lower pharyngeal (left)	20
56-6081	Lower pharyngeal (left)	21
56-5535	Lower pharyngeal (left)	22
56-1636	Thoracic vertebra	30

## FISH REPRESENTED

A single species (and subspecies) of fish is represented, the Mojave Tui Chub (Fig. 32), currently treated as *Gila bicolor mohavensis* (Snyder), as by Miller (1973:8), Hubbs, Miller, and Hubbs (1974:146), Moyle (1976:164), and Hubbs, Follett, and Dempster (1979:11). It was originally described as *Siphateles mohavensis* by Snyder (1918:297), and was later known as *Gila mohavensis*, as by Bailey and Uyeno (1964:238).

The common name Tui Chub is derived from the Northern Paiute *tuipak<sup>w</sup>i* (see Loud and Harrington 1929:156, as *tui-pagwI*).

As mentioned above, this is the only fish known to be native to the Mojave River. Another minnow, the Arroyo Chub, *Gila orcuttii* (Eigenmann and Eigenmann), at one time regarded as native to the Mojave River (Hubbs and Miller 1943:348, 354), was subsequently believed to have been introduced into the Mojave River as a bait minnow (Hubbs and Miller 1948:41).

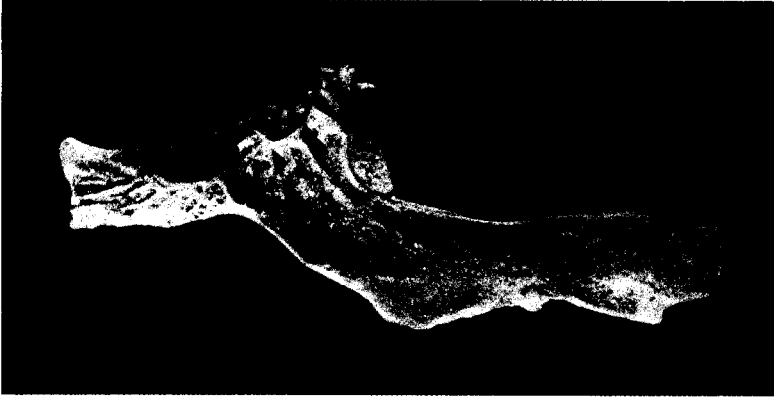


Fig. 29. Basioccipital, length 17.7 mm; representing a Mojave Tui Chub (*Gila bicolor mohavensis*) ca. 19 cm in total length; Cat. No. 56-3420.

Fig. 30. Lower pharyngeal (left), length 7.3 mm; representing a Mojave Tui Chub (*Gila bicolor mohavensis*) ca. 8 cm in total length; Cat. No. 56-6081.

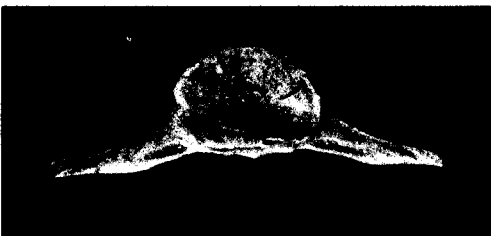


Fig. 31. First vertebra (posterior aspect); width including rami 12.3 mm; anteroposterior length of centrum 1.5 mm; representing a Mojave Tui Chub (*Gila bicolor mohavensis*) ca. 15 cm in total length; Cat. No. 56-3632.

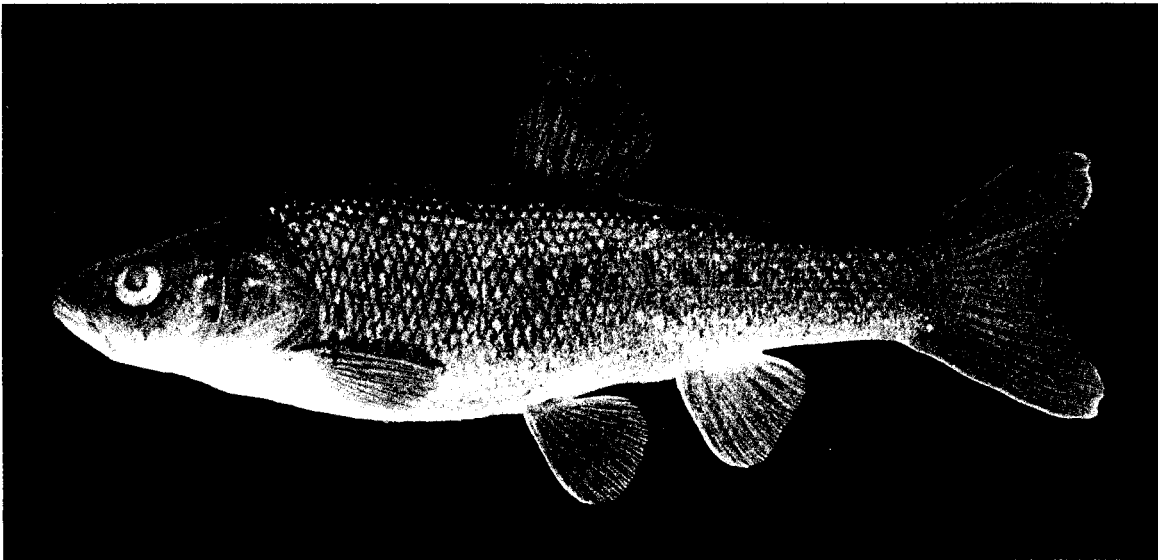


Fig. 32. Mojave Tui Chub (*Gila bicolor mohavensis*), total length 140 mm, collected October 3, 1958, by W. I. Follett at Lake Tuendae, an impoundment of Zzyzxx Springs on west side of Soda Lake, San Bernardino County, California; Calif. Acad. Sci. Cat. No. 26353.

#### DISCUSSION

The Mojave Tui Chub was as good a food fish as Tui Chubs of other subspecies that were extensively used by aboriginal peoples of the Lahontan Basin (see Follett 1967, 1970, 1974, 1980) and were at one time favorably regarded even by the White Man (Kimsey 1954:406).

#### SIZE OF FISH

All but three of the Oro Grande fish were larger--and several were considerably larger--than any of 10 collected in the Mojave River near Victorville on August 14, 1915, the largest of which was 149 mm in total length (see Snyder 1918:298).

Presumably, favorable ecological conditions--including a relatively large body of permanent water that persisted for a number of years--enabled the Mojave Tui Chub to attain a large size during the time the Oro Grande site was occupied.

Seven of the Mojave Tui Chubs in the Oro Grande collection were larger than any of 292 Tui Chubs represented in a collection of more than 13,000 fish remains from Lovelock Cave, Nevada (see Follett 1967:95). But in contrast to the largest Mojave Tui Chub represented in the Oro Grande material--about 30 cm in total length and perhaps 350 g in weight--the largest Tui Chub (of a different subspecies) represented in the Lovelock Cave collection was about 38 cm in total length and perhaps

550 g in weight. It had probably been captured at Pyramid Lake or Winnemucca Lake, each of which was an extensive body of water where large Tui Chubs abounded (see Follett 1967:94-96, 99).

#### FISHING METHODS

The people of the Oro Grande site probably captured fish by net (presumably a seine or a dipnet) or, occasionally, by hand.

#### Fiber for Nets

Nets were made from yucca fiber (Rector, this volume, page 17). This was presumably obtained from Mojave Yucca (*Yucca schidigera* Roez1 ex Ortgies), which grew in the Lower Sonoran Life Zone throughout the Mojave Desert and yielded a useful fiber (see McMinn 1939:51).

The Joshua Tree (*Yucca brevifolia* Engelm. in Wats.), which was common on the highest river terrace within 1.5 km of the Oro Grande site (Rector, this volume, page 8), bore short leaves that did not yield a useful fiber (Palmer 1878:647).

#### Brails and Handles

Brails for a seine or handles for a dipnet could have been made from willows (*Salix* spp.), which were frequent on the Mojave River floodplain, or from Common Reed (*Phragmites australis* [Cav.] Trin.), which was common at alkaline seep springs on the river terraces (see Rector, this volume, page 8).

#### Hook and Line

It seems unlikely that the people of the Oro Grande site resorted to fishing by hook and line. Unquestionably, they could have caught fish in that manner. Had they taken the trouble to fashion a small fishhook, perhaps from a cactus spine or from fragments of bird bone, and baited it with a piece of grasshopper, they could surely have caught Mojave Tui Chubs. Using a fly rod and a small (No. 12) hook baited with a pinch of bread, I caught 67 Mojave Tui Chubs (Calif. Acad. Sci. Cat. No. 26353) in less than four hours on October 3, 1958, at Lake Tuendae, an impoundment of Zzyzx Springs adjacent to the Mojave River. But under favorable conditions the people of the Oro Grande site could probably have caught as many fish with a single pull of a simple seine.

#### FISHING AREAS

Near the Oro Grande site, where the Mojave River carried permanent water (see Thompson 1929:Pls. 10, 12), a seine or a dipnet could have

been used, perhaps most effectively during the period of low water beginning about September.

Winter floods may have formed overflow ponds here and there along the river bed. As the ponds receded, Mojave Tui Chubs that had been swept into those ponds would have been exposed to easy capture by seine or dipnet, or even by hand.

At long intervals, a violent rainstorm, sweeping down the steep northern slopes of the San Bernardino Mountains, has transformed the entire Mojave River bed, including its many kilometers of normally dry sands, into a torrent that has filled the dry basin of Soda Lake and has overflowed into the desert playa of Silver Lake, the extreme flood terminus of the Mojave River--leaving many Mojave Tui Chubs stranded when the temporary lake dried up. Such a great flood occurred in 1916 (Thompson 1929:566); another, in March, 1938 (Hubbs and Miller 1943:345).

Had such a flood occurred in aboriginal times, people from the Oro Grande site might have set out in search of Mojave Tui Chubs stranded here and there down the river, far below the usual fishing area where permanent water adjoined the Oro Grande site. In the unlikely event that their search had taken them to the vicinity of Soda Lake, more than 110 km from the Oro Grande site, they would doubtless have found that the stranded fish had been preempted by people living in that vicinity. Zzyzx Springs, producing a flow of clear cool water on the west side of Soda Lake near the railroad station of Soda, would surely have been a village site in aboriginal times.

#### ACKNOWLEDGEMENTS

I express my appreciation to Philip J. Wilke and Paul E. Langenwaller, II, for permission to report upon this collection of fish remains and for information; to Lillian J. Dempster for assistance with the manuscript; to Maurice C. Giles and Susan Middleton for assistance with the photographs; and to John Thomas Howell and Edward S. Ross for information and advice.

*California Academy of Sciences, San Francisco*

#### REFERENCES

- Bailey, R. M., and T. Uyeno  
1964 Nomenclature of the Blue Chub and the Tui Chub, Cyprinid Fishes from Western United States. *Copeia* 1964:238-239.
- Bean, L. J., and C. R. Smith  
1978 Serrano. In: Handbook of the North American Indians, Vol. 8, California, R. F. Heizer, ed., pp. 570-574. Washington: Smithsonian Institutj

## Follett, W. I.

- 1967 Fish Remains from Coprolites and Midden Deposits at Lovelock Cave, Churchill County, Nevada. Berkeley: University of California Archaeological Survey Report No. 70:93-116.
- 1970 Fish Remains from Human Coprolites and Midden Deposits Obtained During 1968 and 1969 at Lovelock Cave, Churchill County, Nevada. Berkeley: University of California Archaeological Research Facility Contribution No. 10:163-175.
- 1974 Fish Remains from Site NV-Wa-197, Winnemucca Lake, Nevada. Berkeley: University of California Archaeological Research Facility Contribution No. 21:37-43.
- 1980 Fish Remains from the Karlo Site (CA-Las-7), Lassen County, California. Journal of California and Great Basin Anthropology 2(1):114-122.

## Grinnell, J.

- 1935 A Revised Life-Zone Map of California. University of California Publications in Zoölogy XL:327-329.

## Hubbs, C. L., W. I. Follett, and L. J. Dempster

- 1979 List of the Fishes of California. Occasional Papers of the California Academy of Sciences No. 133.

## Hubbs, C. L., and R. R. Miller

- 1943 Mass Hybridization Between Two Genera of Cyprinid Fishes in the Mohave Desert, California. Papers of the Michigan Academy of Science, Arts, and Letters XXVIII for 1942:343-378.
- 1948 The Zoological Evidence: Correlation Between Fish Distribution and Hydrographic History in the Desert Basins of Western United States. In: The Great Basin, with Emphasis on Glacial and Postglacial Times. Bulletin of the University of Utah 38(20) [Biological Series X(7)]:17-166.

## Hubbs, C. L., R. R. Miller, and L. C. Hubbs

- 1974 Hydrographic History and Relict Fishes of the North-Central Great Basin. Memoirs of the California Academy of Sciences VII.

## Kimsey, J. B.

- 1954 The Life History of the Tui Chub, *Siphateles bicolor* (Girard), from Eagle Lake, California. California Fish and Game 40(4): 395-410.

## Kroeber, A. L.

- 1925 Handbook of the Indians of California. Washington: Bureau of American Ethnology Bulletin No. 78.

- Loud, L. L., and M. R. Harrington  
1929 Lovelock Cave. University of California Publications in American Archaeology and Ethnology 25(1).
- McMinn, H. E.  
1939 An Illustrated Manual of California Shrubs. San Francisco: J. W. Stacey, Inc.
- Miller, R. R.  
1973 Two New Fishes, *Gila bicolor snyderi* and *Catostomus fumeiventris*, from the Owens River Basin, California. Occasional Papers of the Museum of Zoology, University of Michigan No. 667.
- Moyle, P. B.  
1976 Inland Fishes of California. Berkeley, Los Angeles, London: University of California Press.
- Palmer, E.  
1878 Plants Used by the Indians of the United States. The American Naturalist XII(10):646-655.
- Snyder, J. O.  
1918 The Fishes of Mohave River, California. Proceedings of the United States National Museum 54(2236):297-299.
- Thompson, D. G.  
1929 The Mojave Desert Region, California. A Geographic, Geologic, and Hydrologic Reconnaissance. U. S. Geological Survey, Water-Supply Paper 578.