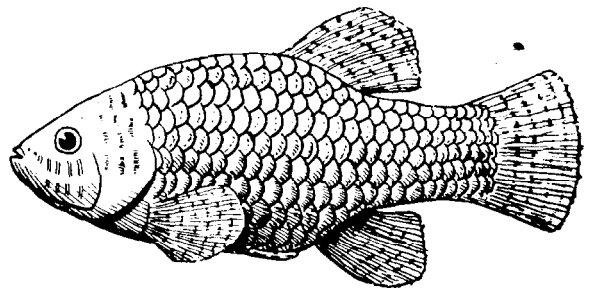


Desert Fishes Council



"Dedicated to the Preservation of America's Desert Fishes"

Proceedings of the Desert Fishes Council

VOLUME XI

Edited by
Edwin P. Pister

The Eleventh Annual Symposium

Held at
National Park Service Headquarters
Furnace Creek
Death Valley National Monument
November 15-17, 1979

Produced in cooperation with the University of Nevada, Las Vegas

Desert Fishes Council, 407 West Line Street, Bishop, California 93514
October 15, 1980

The Current Status and Future Management
of the Desert Pupfish, *Cyprinodon macularius*,
Within California

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Abstract--The distribution of the desert pupfish has become severely limited within California during recent years. At present, populations exist only within various habitats at the Salton Sea and in San Felipe Creek, a perennial desert stream which is a tributary to the Sea only during times of flooding. Quarterly surveys of desert pupfish habitats at the Salton Sea indicate that pupfish numbers and distribution have become severely reduced due to the widespread establishment of numerous exotic species and also to severe habitat modifications. Despite the occurrence of several exotic species within San Felipe Creek, two separate surveys indicate that pupfish are by far the most abundant species and are distributed all along the 7.2 km permanent water portion. Proposed groundwater pumping for agricultural development on large sections of land adjacent to the creek seriously jeopardize this last natural viable population and habitat of the desert pupfish in California. In order to afford this species protection from extinction, it should be placed on both the state and federal endangered species lists. In addition, basic hydrological data for San Felipe Creek is also necessary before changes in zoning laws and land acquisitions can be proposed.

Evidence from various sources demonstrates that the distribution of the desert pupfish, *Cyprinodon macularius*, has become very limited within California. This species, once endemic to the Colorado River and numerous springs throughout the Salton Sink, is presently found only in the Salton Sea and several of its tributaries. Observations made by numerous individuals indicate that their distribution and numbers have become severely limited even within these areas, probably due to the establishment of exotic species.

Quarterly surveys were conducted at the Salton Sea to determine the distribution, relative abundance, and status of the desert pupfish. Minnow traps were used to sample fish species within irrigation drains, shoreline pools, natural tributaries and the Salton Sea proper between March 1978 and January 1979. In addition, San Felipe Creek, a tributary to the Salton Sea, was surveyed in November 1978 and March 1979.

Thirteen non-native species of fish and one invertebrate species were found in addition to the desert pupfish. Desert pupfish comprised 3% of the total catch from the four surveys of the irrigation drains, 5% of the catch from the shoreline pools, and less than 1% of the catch from the natural tributaries and the Salton Sea proper. On the other hand, the sailfin molly, *Poecilia latipinna*, accounted for 85% of the total catch in the quarterly surveys of the irrigation drains, 81% of the catch in the shoreline pools, 70% of the catch from the natural tributaries, and 98% of the catch in the Salton Sea proper.

In contrast to the findings at the Salton Sea, desert pupfish made up 70% of the total catch in San Felipe Creek. Although several non-native species were

present, including the sailfin molly, their numbers were quite low which is probably due to the habitat favoring desert pupfish over the other species and to limited access of exotic species to San Felipe Creek.

It is not known whether desert pupfish populations within the various habitats at the Salton Sea will decline to the point of extinction. However, due to the abundance and diversity of the exotic species, especially the sailfin molly and the Zill's cichlid, *Tilapia zillii*, and extreme habitat modification within the irrigation drains, there may be little that can be done to insure the continued existence of the desert pupfish in these areas.

Despite the fact that a good, viable population of desert pupfish exists within San Felipe Creek, an immediate threat to the habitat is posed by the planned agricultural development of 16 ½ sections of land adjacent to the creek. Proposed groundwater pumping in this area may completely dry up the surface flow in San Felipe Creek.

In order to provide protection for the desert pupfish and its habitats within the Salton Sea and San Felipe Creek, this species should be placed on both state and federal endangered species lists. Further management objectives should include: 1) initiation of hydrological studies in the area of San Felipe Creek to determine the location and nature of the aquifers supplying the surface flow as well as the impact of groundwater pumping in this area; 2) persuade Water Power and Resources Service and Imperial County to withdraw land in and adjacent to San Felipe Creek from zoning which allows for agricultural development; 3) acquire private land bordering and within San Felipe Creek to preserve integrity of the habitat and; 4) investigate the feasibility of installing a concrete spillway below the permanent water portion of San Felipe Creek to block the upstream movement of exotic species. Cooperation between county, state, and federal governments is necessary to protect this species and its few remaining habitats, because without this protection this native species could become extinct in California.