

Western Mosquitofish *Gambusia affinis*

Ecology: Mosquitofish are small, 3 to 7 cm in length, poeciliids with short bodies, flat heads and rounded tails. Mosquitofish live in fresh and brackish water in vegetated ponds and lakes, backwaters and quiet pools of streams. They are able to survive in waters with little oxygen, in high salinities (including twice that of sea water) and in temperatures up to 42°C (McCullough, 1998). They have upturned mouths for surface feeding on zooplankton and other invertebrate prey (Rauchenberger 1989). This species is well known for its high feeding capacity and adults will even feed on their young opportunistically (Benoit et al. 2000). Chips (2004) observed maximum consumption rates of 42 to 167% of their body weight per day. Mosquitofish have internal fertilization and are ovoviviparous (Meffe 1986). Females can have four to five broods annually with brood sizes up to 315 young (Krumholz 1948).

Mosquitofish were originally introduced and spread as a way to reduce mosquito populations and mosquito-borne diseases. Recent research, however, questions the efficiency of this species as a mosquito control agent and suggests that negative impacts on native species may outweigh the benefits from possible mosquito control (Courtenay and Meffe 1989). Because of their aggressive and predatory behavior, mosquitofish may negatively affect populations of small fish through predation and competition (Courtenay and Meffe 1989). They may also benefit mosquitoes by decreasing competitive and predation pressure from native zooplankton and predatory invertebrates (Blaustein and Karban 1990). Introduced mosquitofish can displace native fish species considered more efficient mosquito control agents (Courtenay and Meffe 1989).

Introduced mosquitofish have contributed to the elimination or decline of populations of federally endangered and threatened fish species in the western U.S. and are responsible for the elimination of the least chub *Iotichthys phlegethontis* in several areas of Utah (Mills et al. 2004). This species is also considered partially responsible for the decline of several amphibian species in the western U.S. (Gamradt and Kats 1996; Goodsell and Kats 1999).

Distribution: The mosquitofish is native to the south-central United States and Mexico (Rauchenberger 1989). Though, through extensive introductions, it now has a pan-global distribution. Mosquitofish have been introduced into ponds throughout Utah, however, colder temperatures in much of the state limited full establishment. Mosquitofish in Utah have been most successful in spring fed pools where relatively constant water sources improve survival. Breeding populations are established in warm springs and littoral zones of ponds in the Bonneville Basin (Sigler and Sigler 1996).

Pathway of Introduction: In the United States the first known introductions of mosquitofish, outside of their native range, took place in the early 1900's as mosquito control agents (Krumholz 1948). Mosquitofish were commonly and widely introduced during the following decades. Mosquitofish were intentionally introduced into Salt Lake City, Utah as a biocontrol for mosquitoes in 1932 (Reese 1934). Mosquito abatement programs in Utah continue to utilize western mosquitofish as a biological control (Billman et al. 2007).

Management Considerations: Rotenone can be used to remove fish from small areas of permanent water. Rotenone, however, is indiscriminate, so non-target species need to be removed prior to its application and prevention of reinvasion from tributaries should be considered (Mills et al. 2004).

Least chub have been shown to consume immature mosquitoes even in the presence of other prey and unlike mosquitofish; least chub are able to survive drought conditions and harsh winters (Billman et al. 2007). The native least chub is being considered as an alternative form of mosquito control to mosquitofish (Pers. Comm. Krissy Wilson. 2008. Native Aquatic Species Program Coordinator, Utah Division of Wildlife Resources). The use of least chub as an alternative biocontrol to mosquitofish would minimize negative impacts on other native species and greatly enlarge the distribution of least chub.

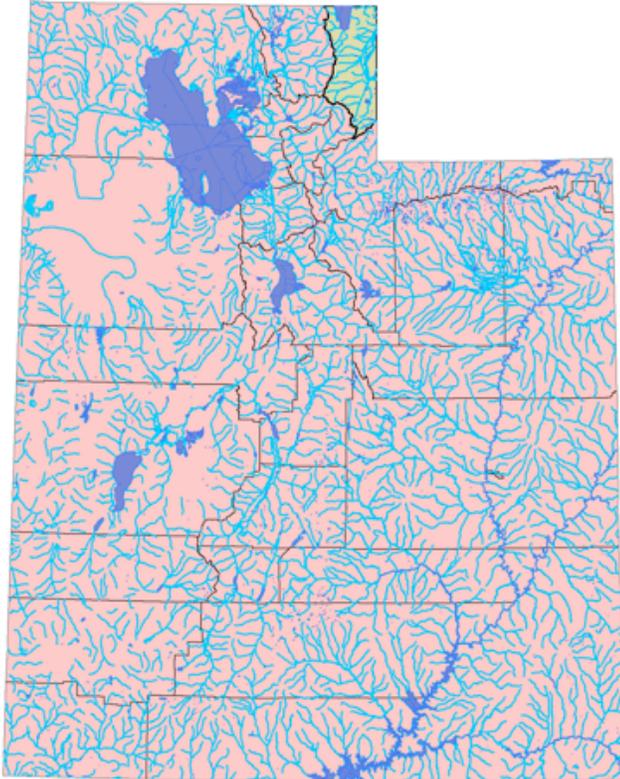
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Mosquitofish

- Major Waterways
- Counties mosquito fish is present.



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Fishbase Online