

HOW TO OBTAIN MOSQUITOFISH *CONTINUED*

tainer unless the air space is equivalent to the water space in the container. Large plastic containers, those with large surface areas, are most practical. Keep the containers out of the sun light during transport.

INTRODUCING FISH TO YOUR POND

Fish should be introduced into the pond as soon as possible. To avoid shock when introducing fish into the pond, it is recommended that you equalize the water in your bucket of fish. You can achieved this by either adding some pond water to the bucket, or place the bucket into the pond for a short time to allow the two water temperatures to equalize.

The San Mateo County Mosquito Abatement District has an ongoing program of inspection and stocking of all known ponds in the District. This service is done at no additional cost to the residents. If you have a pond and would like fish , please call the District office at 650.344.8592 to set up a delivery.

CHLORAMINES

Tap water in San Mateo County is treated with chloramine (and not chlorine). Although these chemicals are toxic to fish, shellfish, reptiles and amphibians, they do not affect mosquitoes.

Chloramines are chemicals which contain chlorine and ammonia. Chloramines are considered safer for drinking water than chlorine because they reduce the formation of hazardous by-products and keep the bacteria killing disinfectant in the pipelines for

longer periods of time. Unlike chlorine, chloramines do not dissipate from water left standing overnight. To be completely safe, always pre-treat your water before adding fish to your pond no matter how little you add. Chloramine residuals in treated water should be below 0.1 mg per liter. For more information visit www.sfwater.org.

DISTRICT OBJECTIVE

To provide an effective abatement program primarily directed toward the control or prevention of mosquito production. Elimination of unsupervised water impoundments is an essential step to safeguard against mosquito problems.

DISTRICT APPROACH

Under the California Health and Safety Code, mosquito abatements are granted powers to take all necessary and proper steps for the elimination and extermination of mosquitoes. To implement the program objectives, district personnel make routine inspections of countless mosquito sources, such as ditches, channels, lagoons, drain lines, marshes, creeks, lakes, flood control basins, utility vaults, catch basins, and fish ponds. When mosquito production is found, appropriate action is taken to control or eliminate the problem.

San Mateo County
Mosquito Abatement District

1351 Rollins Road
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Facts about

MOSQUITO FISH

In California



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GAMBUSIA AFFINIS

The mosquito fish (*Gambusia affinis*), a close relative of the guppy and a member of the family Poeciliidae, is used extensively throughout the world by mosquito abatement and vector control agencies for control of mosquito larvae. Mosquito fish can survive wide temperature variations that range from below 0° C. to above 35° C. (32° F. to 97° F.). It has been observed that fry (young fish) are more tolerant of temperature variations than mature fish. The adaptability and hardiness of the mosquito fish, coupled with its ability to produce large numbers of fry during their lifetime, has made the mosquito fish a valuable biological control agent.

REPRODUCTION

Mature females range from 2 to 2.5 inches in length while the males seldom exceed 1.5 inches. *Gambusia* are livebearers (ovoviviparous), better adapted to begin the struggle for existence than fish hatched from eggs. Under favorable conditions, the fry (newly born fish) reach sexual maturity in 6 to 8 weeks. The females, in a season, may bear 3 to 4 broods, the first of which may number only a few fry. At sexual maturity, a female may produce from 60 to 100 fry in a single brood. The reproductive efficiency of the female declines with age, the broods becoming smaller as the reproductive period progresses.

POND ENVIRONMENT

Under favorable conditions, mosquito fish, in California, will live 2 to 3 years. Occasionally a large die-off may occur during the winter months when low temperatures adversely affect the fish. To avoid fish mortality, supplementary feeding should be done with caution. Overfeeding may enhance bacterial growth and cause rapid fouling of the water, a condition that may be lethal to fish. Also, artificially fed fish make poor mosquito predators. Although mosquito fish prefer the shelter of rocks, overhanging plants, and banks, they do not thrive in heavily shaded ponds. Normally, the fish seek-out a sunny section of a pond and orient themselves to shallow areas with submerged vegetation, locations often frequented by mosquito larvae and pupae. It is recommended that some aquatic vegetation be provided in ponds as shelter since mosquito fish are cannibalistic on smaller fish. In large ponds, the mosquito fish will sometimes avoid the shaded areas even though numerous mosquito larvae are present. This may occur if the fish are fed artificially or if there is an abundance of naturally occurring food in other areas of the pond. During the colder months, fish become lethargic and feeding activity is reduced. Commercial fish food may be used sparingly as a dietary supplement when mosquito larvae are not present in the water.

Normally 6 to 10 fish are sufficient to stock an average size pond. The high reproductive potential of the mosquito fish will overcome future problems with mosquito larvae. Where large larval mosquito populations exist, it may be necessary to clean the pond or request your local mosquito or vector control agency to treat the pond to destroy mosquito larvae with environmentally safe insecticides prior to planting mosquito fish.

Bird baths or plastic wading pools are seldom suitable as fish ponds. Shallow water does not provide adequate protection from elevated temperatures or predators. In addition, high temperatures enhance algal growth and deplete the amount of oxygen that water can retain.

Limited amounts of algae can be beneficial to mosquito fish. An over-abundance of algae, an amount that impedes light penetration, should be removed. Removal can be achieved by cleaning the pond or using an application of an appropriate algaecide. If an algaecide is selected, care must be practiced to specifically follow the directions. An overdose of the chemical could be fatal to the fish.

OPTIMUM POND CRITERIA

1. Ponds should have a minimum 6 inch water depth
2. Pond edges should have steep sides
3. Rocks and aquatic vegetation should be present
4. Provide a circulation pump to enhance water quality
5. Pond lining. If new cement, allow several weeks to leach-out lime. Rinse the pond several times, and fill with fresh water. After 48 hours, request mosquito fish for the pond

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The San Mateo County Mosquito Abatement District provides free mosquitofish to the public and are normally available from April through October. Call our office at 650.344.8592 to schedule a delivery. Transportation of fish can be critical. Glass and metal containers rapidly conduct heat and in some cases may be toxic to the fish being transported. Avoid sealing the selected con-