



Mosquitofish Fact Sheet



Introduction

In an effort to control mosquitoes with less reliance on the use of pesticides, the New Jersey mosquito control community utilizes several approaches. In an integrated approach to pest control, one aspect is the use of biological control agents. An example of a biological control agent for mosquito control is the mosquitofish, *Gambusia affinis*. When used correctly it is an efficient, cost-effective, and environmentally sound method for the control of mosquito populations. This document describes the use of these fish for mosquito control in New Jersey.

Mosquito Biology

There are over sixty different species of mosquitoes in New Jersey, and they may be found in almost as many varieties of habitat. All have one point in common. They all require, as part of their life cycle, standing water in which to develop. It is in water where, as larvae and pupae, they spend a major part of their life cycle. During these aquatic stages of their development mosquitoes are most susceptible to control. It is at this point that mosquitofish, once introduced, will opportunistically consume mosquitoes.

Mosquitofish Biology

Gambusia affinis, a member of the live-bearer family *Poeciliidae*, is one of the most widely distributed freshwater fish. This is due to its worldwide introduction for mosquito control.

The species thrives in a wide variety of water types, being very tolerant of high water temperatures as well as very low dissolved oxygen levels. *Gambusia affinis* give birth to an average of 40-100 live fry, each of which is approximately 3/8" in length. On average, 3 to 4 broods are produced each year, depending on the size of the female and the length of the breeding season. Females can attain a maximum length of two inches; males one inch. Both sexes seldom survive for more than two years.

Throughout its development *G. affinis* has a voracious appetite, feeding on a wide variety of plankton as well as larger aquatic insects. It is a random feeder, with the availability of food being more important than type.

Being opportunistic feeders, other invertebrates and fish fry are readily consumed by *G. affinis*. In consideration of indigenous non-target species, the N.J. Bureau of Freshwater Fisheries' policy limits the stocking of these fish only into certain state waters for the purpose of mosquito control. The species has a number of natural enemies including wading birds and various piscivorous (fish-eating) fish such as bass, pickerel and sunfish.

When to Stock

As part of an ongoing program, a mosquito control agency should index sites and periodically record mosquito breeding. Early spring fish stocking will be most efficient for season-long control. However, mid-season stocking may be appropriate for areas which periodically dry back and re-flood as a result of seasonal weather.

Which Mosquito Species? Which Not?

In general terms, *G. affinis* is attracted to moving, active prey. The feeding and respiratory habits of the various mosquito species will determine *G. affinis* feeding behavior. For this reason, mosquitofish may not be effective in controlling some *Anopheles* or *Coquillettidia* mosquito species.

In general, the use and application of *G. affinis* should be by professional mosquito control agencies only. These agencies should become accustomed to treating the use of these fish with the same amount of caution as they would a pesticide. No stocking should take place without first performing an adequate mosquito survey and an investigation of the natural history of each site. All stockings should be made with discrimination, and not randomly.

Habitat Types

Not all bodies of water are suitable for introduction of mosquitofish (lakes, ponds and streams generally are not considered as major sources of mosquito breeding). Some examples of mosquito habitats where fish may be introduced include:

- Stormwater management facilities.
- Woodland, or snowmelt created pools, and areas containing sheetwater.
- Ditches and swales.
- Freshwater marshes.
- Dredge spoil impoundments.
- Wildlife production impoundments.
- Artificial containers - i.e. ornamental ponds, abandoned swimming pools and foundations.
- Excavated sites.
- Trash sites.
- Sewage lagoons and/or waste-water facilities.

Potential stocking sites of an environmentally sensitive nature should be reviewed by state biologists from the Division of Fish, Game and Wildlife's Bureau of Freshwater Fisheries, and from the N.J. Office of Mosquito Control Coordination.

How to Determine a Good Site for Mosquitofish

*Not all bodies of water capable of supporting *G. affinis* are necessarily mosquito breeding habitat.*

Mosquitofish stocking shall not take place without first performing an important program of surveillance. Before any insecticide application or water management project is undertaken one must be assured of the presence, density and species of mosquitoes there. This need applies no less significantly with regard to the stocking of mosquitofish.

Evaluate Efficiency

The continued presence of adequate numbers of mosquitofish should result in the reduction of the mosquito population and any associated pesticide

applications. Mosquito control inspectors and biologists should continue to periodically survey sites after stocking in order to evaluate the overall efficiency of mosquitofish as control agents.

Official N.J. Mosquitofish Policy

It is the policy of the New Jersey Bureau of Freshwater Fisheries to permit the stocking of the mosquitofish, *G. affinis*, in certain state waters for the purpose of mosquito control. Stocking will be permitted only in those waters in which no indigenous fish population exists and from where the mosquitofish can be reasonably expected not to escape. Additionally such waters must harbor sufficient numbers of mosquito larvae/pupae as determined by the state or a county mosquito commission or agency to justify introduction of the fish.

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