

# Mosquito Control Biology



**CHARLOTTE COUNTY**

**Mosquito & Aquatic Weed Control**

Charlotte County Mosquito Control strives to control the mosquito populations through an integrated pest management approach consistent with applicable laws and justified by principles of public health, vector control, environmental safety, and fiscal responsibility.

The Biology Department is responsible for a wide range of activities including mosquito surveillance, species identification, resistance testing, the sentinel chicken program, the mosquitofish program, and public education and outreach. Many people are unaware of what goes on behind the scenes at mosquito control. All activities conducted by the biology department are an essential part of any mosquito control program.



## Mosquito Surveillance

Mosquito surveillance is done in a couple of ways. The most common forms of surveillance are done by trapping and landing rate counts. According to Florida Statute (FS 5E-13), a certain threshold of mosquitoes must be met or exceeded before spraying can occur. As a result, there is no set spraying schedule. Areas are scheduled for spray based on the results of our surveillance methods.

Trapping is primarily done using CDC-light traps, which are unbaited. Mosquitoes are attracted to a light and get sucked into a net by a fan. The traps are set bi-weekly and collected the following day. The trapped mosquitoes are brought back to the lab and frozen, where they will then be sorted, identified, and logged. Charlotte County has logged at least 40 different species of mosquitoes! Each species has unique characteristics, including breeding site preferences and disease vectoring capabilities (or lack thereof). Therefore, knowing what species are in the county is extremely important.



Landing rate counts are done in the morning at set locations around the county. Specialists will stand at these locations for one minute and count how many mosquitoes land on them from the waist down. This form of surveillance gives us a quick idea of what the mosquito population is like in each area.

## Resistance Testing

Resistance testing is an important way of being able to tell if the mosquito population is still susceptible to the treatment chemical being used. If the same chemical is used over and over, mosquito offspring will eventually become naturally resistant to the active ingredient in the formulation and it may lose its effectiveness.



A simple quick test, called cage-testing, can be used by collecting live adult mosquitoes from the wild and putting them inside a small screened cage. This cage is set in an area to be sprayed and collected a short time after treatment by truck or helicopter. If the treatment was effective, most of the mosquitoes inside the cage should have succumbed to the material within a standard time period.

Another reliable test that can be done to measure resistance or the effectiveness of a treatment material is called a bottle bioassay. Mosquitoes can be lab-reared from wild larvae or collected in the field as flying adults. A very dilute formulation of the chemical is made and the insides of the bottles are coated with it, except for one bottle that serves as a control. Adult mosquitoes are then placed in each bottle where they come into contact with the chemical. 100% mortality should be achieved within a specified time period (usually 30-45 minutes), except for the control bottle where the mosquitoes are expected to still be thriving. Such a test allows the biologists to determine the efficacy of the treatment chemical being used.

## Mosquitofish Program

Charlotte County Mosquito and Aquatic Weed Control has been providing *Gambusia holbrooki* (commonly called mosquitofish) free of charge to citizens for over a decade. We keep three tanks stocked with mosquitofish for the purpose of distribution to citizens with ornamental ponds, rain barrels, or other areas that hold water for long periods of time. Mosquito Control personnel have even used them as part of a biological control effort, releasing them into flooded woods, ditches, and even abandoned swimming pools. Related to a guppy, they are surface feeders and are very efficient at eating mosquito larvae and pupae that hang at the surface of the water to breathe. These fish are native to Florida and can be seen in abundance in ditches and along pond margins. They stay relatively small, with females only reaching 2-3" in length, and can rapidly reproduce.

If you are interested in getting some mosquitofish for your property, please call the mosquito control hotline at 941.764.4370. A biological specialist will first have to inspect the area where they are to be released before dispersing them.



Mosquitofish can eat up to 100 mosquito larvae a day



For more information on Mosquito Control: [CharlotteCountyFL.gov/mosquito](http://CharlotteCountyFL.gov/mosquito)

# Sentinel Chicken Program

Charlotte County currently maintains seven sentinel chicken flocks placed around the county. These chickens are tested weekly for the presence of antibodies produced in the blood if the chicken is exposed to West Nile virus, Eastern equine encephalitis, St. Louis encephalitis, or Highlands jay virus. A small blood sample is taken from the wing and then prepped in the lab and transported to the Department of Health Virology Laboratory in Tampa where the blood serum is tested. If any of the sentinel chickens test positive, Mosquito Control responds by treating the corresponding area to ensure none of these diseases are passed on to humans or horses. Once a chicken tests positive and the test is confirmed, she gets to retire from the program and is immediately replaced by a new chicken from our home flock of “sterile” chickens. The birds that test positive do not pose a threat to humans or animals, as they are known as a “dead end host” and the virus can no longer be passed on. We donate our retired chickens to local farms and 4-H groups.



Every year a new batch of day-old chicks are raised inside a mosquito free screened in coop. Once they are big enough fresh flocks are taken and placed out around the county to become our new sentinel chickens of the season.

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## Protect Yourself - Remember the 3 D's



Phone: 941.764.4370

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