

## Lee County Mosquito and Hyacinth Control Districts



Photo courtesy of Lt. Jennifer Wright, US Navy

The Lee County Mosquito Control District encompasses ninety-eight percent of the County or approximately one thousand square miles including more than 56,000 acres of salt marsh habitat that produces large populations of pestiferous salt marsh mosquitoes. After high tides or rain, mosquitoes from these coastal habitats may fly as far as 50 miles from the site of their emergence and aggressively attack humans and other animals in pursuit of a blood meal. Most of these coastal habitats are not accessible by vehicle and inspectors must use helicopters to gain access to these areas for inspection and control of immature mosquito stages. In addition, there are many other mosquito species in Lee County that breed in both permanent and temporary fresh water habitats, including some that can transmit mosquito-borne diseases such as West Nile Virus and St. Louis Encephalitis.



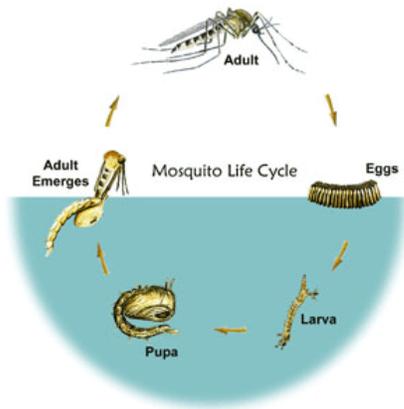
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## Mosquito Life Cycle



All mosquitoes have four stages of development which include egg, larva, pupa and adult. Depending on the species, mosquito eggs are laid either directly on the water or on moist soil in areas that are prone to flooding such as ditches or tidal marshes. Around the home mosquitoes lay eggs in discarded tires, bird baths, pet water dishes, clogged rain gutters, and anywhere else that water can collect. Eggs laid in the soil or dry containers can lie dormant for several years and will not hatch until they are activated by rain or tides. Once the eggs hatch the larvae go through 4 molts (each molt is called an instar) and then they become less active and develop into pupae. Adult mosquitoes can emerge from pupae in one or two days and the whole process from egg to adult can take as little as five days during warm weather. This means that there is only a four or five-day window-of-opportunity to control mosquito larvae after a rain or tide event.

Both male and female mosquitoes feed on plant nectar for energy. After mating, only the female mosquito seeks a blood meal in order to obtain protein which is needed for egg development. The male mosquito dies shortly after mating but the female can survive for several weeks and produce two to four egg batches. The male mosquito usually emerges from the pupa a day or so before the female. Using this information allows us to better predict the timing of an emergence of biting female mosquitoes.



## Mosquito Control Activities



The basis for any mosquito control operation is surveillance, and this is a daily procedure at the Lee County Mosquito Control District. Aerial inspectors travel to the most remote areas of the county via helicopter to check salt marsh habitats. Ground inspectors look for breeding habitats throughout the county and respond to service requests from citizens. In addition, trap trucks go out each evening and survey the entire county for adult mosquito activity and also measure rainfall activity. The results of all these surveys are used to determine when and where to concentrate control activities.

The Lee County Mosquito Control District uses a variety of biological, physical, and chemical control techniques to reduce mosquito populations. Materials that are used to control mosquito larvae are called larvicides, and materials applied to control adult mosquitoes are called adulticides. All materials used to control mosquitoes have been thoroughly tested as part of the U.S. Environmental Protection Agency registration process and when used according to the product label directions will not pose any unreasonable risk to Lee County citizens or the environment. Larvicides and adulticides are applied by ground and air using highly sophisticated application technology including satellite navigation and global positioning for precision application targeting.

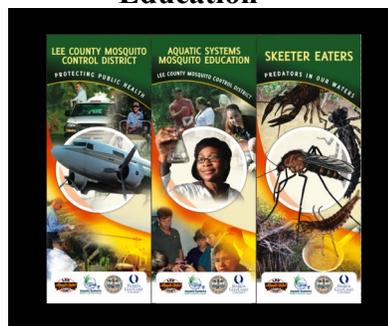


## Mosquito-Borne Disease Monitoring

Mosquito-borne diseases, such as malaria, dengue and yellow fever have plagued humans for thousands of years. Although organized mosquito control in Florida has greatly reduced the incidence of these diseases, the threat still remains for some mosquito transmitted diseases including West Nile virus (WNV), Eastern Equine Encephalitis (EEE), St. Louis Encephalitis (SLE), dog heart worm, and malaria.

Lee County Mosquito Control District monitors the County for arbovirus transmission activity (WNV, EEE and SLE) by using sentinel chicken flocks distributed around the county. Blood from the chickens is drawn twice monthly and analyzed in the lab to determine if any disease-carrying mosquitoes have infected the birds. If an arbovirus transmission is detected in a chicken flock, then testing is conducted weekly until evidence of transmission ceases in that area. When arbovirus transmission of significant threat to human health is detected, that area of the county is thoroughly inspected to locate and eliminate mosquito breeding.

## Education



The Lee County Mosquito Control District takes great pride in an educational program designed to teach our school age children about mosquitoes and the role that mosquito control plays in the local community. This hands-on learning experience is being offered to elementary, middle, and high school classes county-wide. Children learn to identify different kinds of mosquitoes, their habitats and life cycles, and are familiarized with the techniques currently being used to control mosquitoes. This is a learning experience many will never forget.

## Research and Development



District research and development programs are designed to evaluate the efficacy of new commercial products, develop novel types of environmentally compatible biological and chemical control agents, and develop new insecticide and herbicide delivery systems. A number of insecticides, application equipment and techniques now in world-wide use were originally tested or developed in Lee County by District personnel.

To assure that mosquito control materials used by the District remain effective and work to their best advantage, it is important to monitor the mosquitoes for resistance to these products. To do this, early instar mosquito larvae are collected from the wild, reared to the third instar of larval development, and then treated with different concentrations of mosquito control agents in a series of standard aquatic bioassays. Bioassay results help determine the minimum dosage necessary for adequate control and also indicate when resistance to a particular material is developing. The District has also worked to improve application techniques. For example, the District conducted wind tunnel evaluations of spray nozzles used in mosquito control to accurately characterize nozzles and droplets generated.

## Lee County Hyacinth Control District



The Lee County Hyacinth Control District is responsible for the control of aquatic weeds that can clog our waterways. Field inspectors monitor the Caloosahatchee River as well as ponds, lakes, and hundreds of miles of waterways throughout the county. When aquatic weeds become a concern to residents or interfere with the use of a waterway, a treatment plan which includes chemical or biological control is developed.

If the aquatic weed is the type that may be treated biologically, plant-eating fish are used. The White Amur, or grass carp as they are commonly called, provide excellent control for some types of aquatic weeds since they can eat the equivalent of their own body weight daily. These fish are raised at the District, then released and monitored in aquatic areas.

The District monitors water quality in a cooperative program called Pond Watch. The goal is to educate homeowners on the effect of nutrient loading into the waterways of Lee County.

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## Mission Statement

Lee County Mosquito and Hyacinth Control Districts are committed to improving the quality of life, facilitating outdoor activities and protecting the public health in our community by implementing environmentally sound practices that control mosquitoes and invasive aquatic weeds throughout Lee County.



## What can you do to prevent and control mosquitoes?

- Remove or dispose of containers that hold rain water such as tin cans, tires, buckets, pots, etc.
- Change water in outdoor pet dishes twice per week.
- Clean clogged rain gutters and drain flat roofs of any standing water.
- Repair leaks around faucets or air conditioners that leave water standing for several days.
- Stock ornamental ponds with fish.
- Change water in bird baths, fountains or troughs twice per week.
- Turn over unused wading pools or other containers that collect and hold water.
- Cover rain water storage containers with screen.
- Eliminate seepage from septic tanks, cesspools, and cisterns.
- Irrigate lawns in a manner that does not leave water standing for several days.
- Wear repellent that contains Deet or Picaridin on exposed skin to prevent mosquito bites.
- Avoid outside activity at dusk and dawn when mosquitoes are most active.

## Service Requests

Lee County citizens experiencing problems with mosquitoes or aquatic weeds should contact the Lee County Mosquito Control District or the Lee County Hyacinth Control District at (239) 694-2174. Further information is available at the Districts' websites at [www.lcmcd.org](http://www.lcmcd.org) or [www.lchcd.org](http://www.lchcd.org).