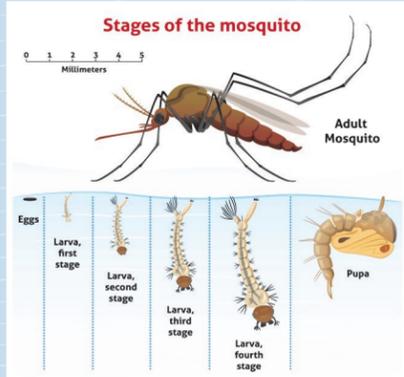


Educational Outreach

Mosquito control programs need the support of an informed public, so community outreach will continue to be an important part of the 2019 program. Educational presentations are designed to raise awareness of mosquito habitats and life cycles. Each season homeowners are reminded of ways to reduce backyard larval breeding. Presentations are given to community service groups and local government officials, while flyers, brochures, door hangers, bookmarks, and rack cards are hand-distributed or mailed to county residents and visitors. Media will be utilized for press releases on important activities, events, and disease updates.

The elementary educational school programs will work with both the Bay City Public School and Pinconning School Districts as we continue to focus on STEM (Science, Technology, Engineering, and Math) learning opportunities. This partnership involves promoting a First Grade "Life Cycle" program that prioritizes hands-on learning to increase student engagement and achievement.



Biology Department

Surveillance for immature and adult mosquitoes and the diseases they may transmit is part of the Biology Department's daily operations. Larvae are sampled in woodlots, fields, ditches, pools, sewage lagoons, catch basins, and retention ponds while adults are collected from mechanical traps. The main traps include New Jersey Light Traps, CDC Traps, and Gravid Traps. Data are collected and analyzed in order to control mosquitoes in the most effective way and reduce disease transmission while minimizing environmental impacts. A series of rain gauges, as well as GIS data, will also be monitored to determine where larval production is likely occurring and to decide where to dispatch crews.

Larval surveillance is important in determining the abundance of mosquito larvae in various habitats. The information can be used to determine optimal times for using larval control materials and to determine the need and timing for adult mosquito control. Crews collect larval samples daily that are identified by lab staff. Larvae are identified to the species level by using dichotomous keys and dissecting microscopes.

Monitoring of mosquito-transmitted diseases will continue for 2019 through processing/testing of adult mosquitoes and dead birds for the presence of West Nile Virus (WNV), St. Louis (SLE), and Eastern Equine encephalitis (EEE) viruses. *Culex* species are important for the amplification and transmission of WNV and SLE virus in Michigan and *Coquilletidia perturbans*, the cattail marsh mosquito, is an important vector of EEE. Staff will keep abreast, through the CDC, of Zika and Chikungunya virus activity. Currently, the vectors for these diseases, *Aedes aegypti* and *Aedes albopictus* have not been found in the Great Lakes Bay Region.



BAY COUNTY MOSQUITO CONTROL

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Bay County Mosquito Control

A DIVISION OF THE BAY COUNTY
ENVIRONMENTAL AFFAIRS & COMMUNITY DEVELOPMENT DEPARTMENT

Spring Mosquito Control

2019 HIGHLIGHTS

- Purchase 3 new vehicles
- Purchase 1 new Grizzly ULV
- Apply for DEQ scrap tire grant
- Expand STEM Program to Pinconning Schools/parochial
- Purchase repeater/duplexer antenna for 2-way radios
- Increase aerial treatment by 2,500 acres to 52,500 acres
- Enhance safety training
- Attend American Mosquito Control Association conference
- Jamestown Canyon virus outreach

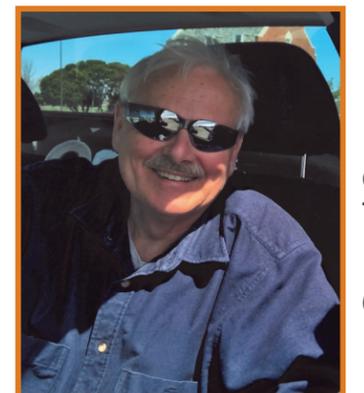


Aerial larviciding of seasonally flooded woodlots signals the beginning of the mosquito control season. Three aircraft are contracted to apply *Bti* to 52,500 acres of flooded woodlot habitat each spring to greatly reduce the spring *Aedes* mosquito population. Historically, treatment begins in mid-April, but commencement is dictated by both weather and larval development. The Biology Department critically monitors larval growth and uses that information to guide the aerial larviciding program. Three keys to a successful spring mosquito larval campaign include:

1. **Surveillance** of mosquito larval populations using pre- and post-treatment dip counts conducted in 40 woodlots to monitor product efficacy. Staff also conduct quality control checks of treated woodlots watching for product placement and dosage rates.
2. **Calibration** involves gathering granules dispensed from aircraft to determine swath width and accurate application dosage rate
3. **Bti Larvicide** kills mosquito larvae, but does not adversely affect other wild-life or beneficial insects, people, or pets when it is applied at a 3 lb/acre dosage rate.



Calibration Crew



Ground Support

Service & Team

Staffing

Seven full-time and 32 seasonal employees will be working during the 2019 season. Seasonal employees fill the following positions: 1 data entry clerk, 2 biology assistants (+ 1 additional for biology/larval technician split), 19 larval control technicians, and 9 adult control technicians.

Shifts run from 8 a.m.—4:30 p.m. (days) and 8 p.m.—2 a.m. (nights), but may be variable. Staff cross-training takes place as technicians may be assigned to a variety of jobs/shifts, as needed, to help control mosquito populations.



Larval Mosquito Management

Larviciding, which includes source reduction, involves the introduction of control materials into aquatic habitats to control larvae or pupae and prevent adult emergence. Habitats with a previous history of breeding will be investigated, with additional emphasis on mapping new sites. We expect to survey nearly 20,000 sites, treating about 15%. Emphasis will be given to source reduction in the form of dumping water from containers to eliminate larvae as opposed to using control materials. Technicians will respond to residential service requests as well as survey known breeding sites or new sites found during daily monitoring.

Larviciding is a main program component, comprising about 70% of control efforts. Control materials utilized include the microbial products *Bti*, *Bacillus sphaericus*, and Natular/spinosad, as well as temephos and larvicide oils. Habitats monitored include catch basins, roadside ditches, abandoned pools, flooded fields and woodlots, retention ponds, scrap tires, and containers.

MqTrack™ GPS units will be utilized in our larviciding fleet to monitor vehicle routes and locations.

Mosquito Mini Training Topics

Technicians are required to attend a day-long May training session where all aspects of the program are discussed. Once a technician begins working, at least two weeks of hands-on training takes place with a certified trainer. Seasonal employees must pass two written tests administered by the Michigan Department of Agriculture and Rural Development (MDARD) to receive a certified pesticide applicator card, with certification lasting three years. MDARD staff will be present to administer the test.

Additional training will take place in 2019 regarding handling hazardous spills, lifting and back safety, driver safety, etc. through OSHA-compliant safety training videos. Additional information will be provided to technicians such as Bay County resident's Frequently Asked Questions. Guest speakers such as MDARD field inspectors will provide insight on regulations governing mosquito control and how to remain compliant.



Service Requests & Specials

SERVICE REQUESTS

Bay County citizens call for service when adult mosquito populations rise or when rain creates standing water on properties. These calls are logged into a database and used as a means to monitor mosquito annoyance. Crews are dispatched to help in each situation. Personally-requested yard treatments will now require a 24-hour lawn posting.

LONG DRIVEWAY PROGRAM

Homes that sit a distance off the main road that do not receive adequate adult mosquito control may opt into the long driveway program (at the discretion of Mosquito Control). Drives are mapped and sprayed during regular township sweeps.

MEDICAL NEEDS PROGRAM

This program offers extra service to residents who have a verifiable, doctor-supported medical need that warrants additional mosquito surveillance/control. Often, these are residents who suffer from severe mosquito allergies.

NO SPRAY PROGRAM

Some residents prefer their property not be treated for mosquitoes. Yellow reflective signs mark property lines as a visual reminder for technicians to "skip" the property. Frequently, residents who opt out of adult mosquito control are still in favor of larval control.

Adult Mosquito Control

Protecting public health by managing mosquito populations is Mosquito Control's primary goal. Through control, the number of adult mosquitoes is lessened, thereby reducing their annoyance and disease risk. In order to meet that goal, 10 ultra low volume (ULV) truck-mounted spray units will be used with treatment occurring from sunset to 2:00 a.m., provided mosquito populations warrant treatment and that weather conditions are conducive. The ULV machines dispense a small amount of control material that must come in contact with adult mosquitoes in order to effectively control them. Machines are calibrated to ensure the proper dosage is applied according to label recommendations. Droplet size is also measured and adjusted throughout the summer ensuring the spray is as effective as possible.

Focus will continue where there is potential disease risk, as well as in areas where high mosquito numbers, as indicated by traps, are adversely affecting Bay County residents. Recreation areas in the county will also be serviced. Four of the 10 ULV machines used will be electric during the 2019 season.

Ten MqTrack™ GPS units, that are fabricated and installed by Velocity Systems of Big Rapids, MI, will track control material application, including rate and volume measurements in adulticiding vehicles.

