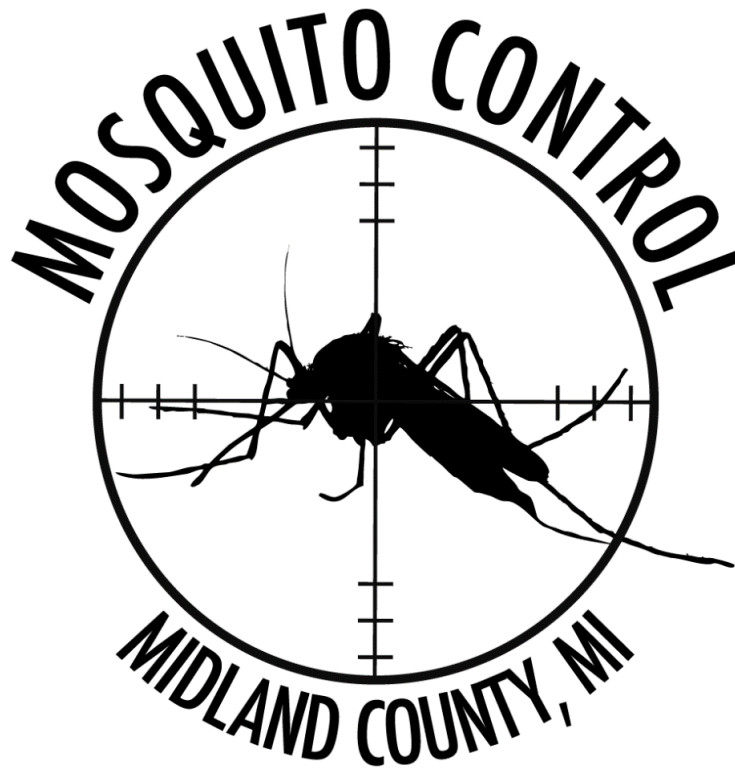


Midland County Mosquito Control

2020 Technical Program



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SUMMARY OF 2020 PROGRAM GOALS & CHANGES

- Continue a third year partnership with Ten16 Recovery Network to hire individuals participating in the Fresh Start program as field technicians. Up to four technicians can be hired in 2020.
- In November of 2019, the Board of Commissioners approved a departmental reorganization of MCMC. All full time staff and the Mechanic will be at the same level and are accountable to the Director with no other personnel between. The season of 2020 will involve a fair amount of adjustment to this new arrangement.
- Hire an Operations Planner, which is the position that has been created to replace the Operations Supervisor.
- The Board of Commissioners approved the request to add a second seasonal Biology Technician to the MCMC staff. This change will take place in 2020. Biology will adjust operations appropriately to best utilize the added capability.
- A new aerial contractor was selected for 2020. Vaughn's flying Service Inc. will be providing the service and a lot of adjustments to this company will be needed.
- MCMC will purchase Altosid water soluble packets for use in catch basins. Altosid (a.i. methoprene) will be used during all three seasonal treatments rather than *Bacillus sphaericus* products due to poor results in some catch basins from the latter products in 2019. Remaining *Bs* material will be used in out-county catch basins.
- A replacement 4X4 truck was purchased in late 2019 and will be equipped this season with an electric ULV for use by the Assistant Forman.
- A Ovi-Catch™ mosquito bucket trap will be placed near tire recycling to monitor for *Ae. albopictus* and *Ae. aegypti* introduction to Midland County.
- Several technological enhancements will be available with the added ESRI Enterprise service and server that the County now has. A number of goals related to this will be sought in the 2020 season.
- MCMC now has a drone pilot and Midland County has a drone. Efforts to explore the use of the drone to enhance MCMC operations will be carried out.

- A capital project at MCMC was approved to install a separate gravel driveway that loops around south of the facility. Also included in the project are plans to install a lean-to for equipment storage and expansion of the southeast parking lot. This project will be incorporated into a greater long-term facility plan.
- Cynthia Chilcote stepped down as a Midland County Representative on the Mid-Michigan Mosquito Technical Advisory Committee. Mr. Roger Garner, former Midland County Emergency Manager agreed to serve the vacant position.

STAFFING

Midland County Mosquito Control (MCMC) has a staff of six full-time employees. Four of these positions are year-round (Director, Operations Planner, Biologist & Office Manager) and two work nine months of the year (two Field Supervisors).

Approximately twenty seasonal employees will be added to the staff for the mosquito control season (April to September). Employment with MCMC is contingent upon obtaining pesticide applicator 7F certification or registration through the Michigan Department of Agriculture and Rural Development (MDARD). New technicians will participate in a formal two-day training session, April 1-2. Technicians will be instructed using the national “core” training manual and MDARD personnel will administer the registered applicator’s exam at the MCMC office on April 3.

Effective November of 2019, Patty Wood resigned in order to take another position. Steps were taken to reorganize the Department and change the responsibilities of the Operations Supervisor position. These changes were approved by the Board of Commissioners on 19 November. The revised departmental organization for the 2020 season will be the following:

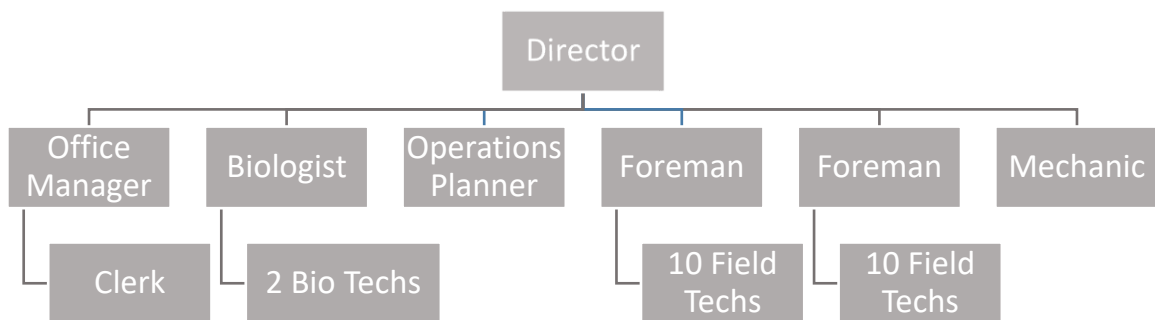


Figure 3. New organizational structure of Mosquito Control for 2020

The Operations Supervisor (OS) position has been re-designated as the Operations Planner. Many of the responsibilities of the OS position remain, but the Planner will not be a supervisor. This individual will work to support the staff and primarily the Field

Supervisors (Foremen) in a number of ways to ensure smooth operations and data analysis. Efforts to hire for the Operations Planner position will begin in 2020.

During the spring season all technicians will work day shift and conduct larviciding operations. Separate day and night crews will be formed on or around May 15. After that time, day-crew technicians conduct surveillance and larviciding while the night technicians participate in larval control operations for the first part of their shift, and then switch to mosquito adulticiding.

The partnership program between Midland County and Ten16 Recovery Network will continue into 2020. This allows for Ten16 to refer certain individuals to Midland County Mosquito Control for seasonal employment consideration as mosquito control technicians. Up to four Fresh Start participants may be hired in 2020.

A second Biology Technician position has been approved by the BOC for hire in 2020. Several adjustments to the Biology Section operations and logistical supports will be required to accommodate this added capability.

Field Staff	Hours in the Field	Activity
Day Crew	8:00 a.m.— 4:30 p.m.	Larviciding
Night Crew	4:30 — 8:00 p.m. and	Larviciding
	8:30 —11:30 p.m.	Adulticiding
Part-Time and Sunday	8:30 —11:30 p.m.	Adulticiding

FIELD OPERATIONS

FIELD OPERATIONS SCHEDULE												
Operation	April		May		June		July		August		September	
	1 st	15 th	1 st	15 th	1 st	15 th	1 st	15 th	1 st	15 th	1 st	15 th
Spring Season												
Woodlot (Bti)		■	■									
Woodlots (MLO)			■									
Summer Season												
Woodlots (MLO)				■	■							
Roadside Ditches (Bti)						■	■	■	■	■	■	■
Summer Sites (Bti, MLO)						■	■	■	■	■	■	■
Catch-basins (BS, Altosid PG)						■	■	■	■	■	■	■
County Drains (Bti)								■	■	■	■	■
Adulticiding (Permethrin)									■	■	■	■

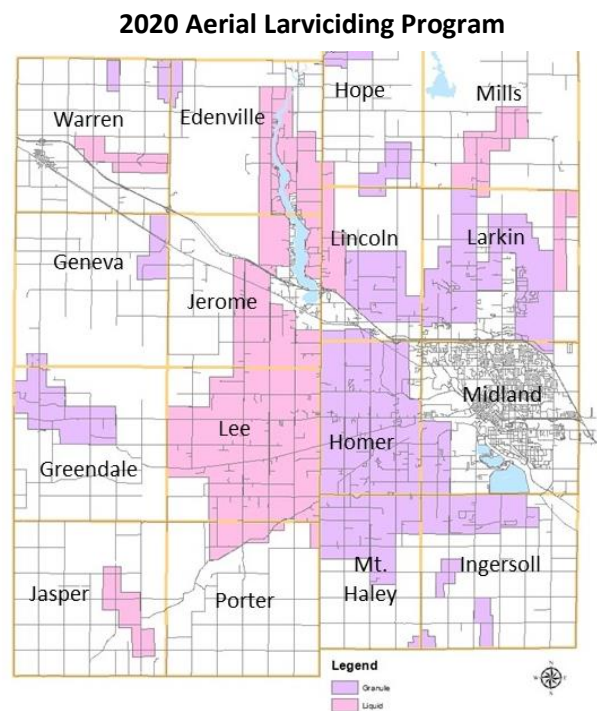
Spring Larviciding (April 10 — May 15)

Ground Larviciding The 2020 program will begin in April when supervisory personnel and seasonal technicians start treatment of woodland sites. Field personnel will treat approximately 3,000 acres of woodland pools. Vectobac® 12AS (liquid *Bti*) will be the primary larvicide used in woodlands during this period. BVA-2 MLO (Mosquito Larvicide Oil) will be used after the spring *Aedes* species mosquitoes begin to pupate. Select woodlots will be treated with granular BTI (Vectobac® G) utilizing the Stihl motorized backpack units.

Aerial Larviciding. A total of 58,000 acres of woodlots are scheduled for aerial treatment this year consisting of 28,000 acres treated with liquid *Bti* and 29,600 acres with granule *Bti*. Treatment area will be approximately the same as 2019.

Vectobac® G granules and Vectobac® 12AS liquid *Bti* will be used in 2020. A different aerial applicator will contract to carry out the service in 2020. The aerial contract was put out for bid in late 2019 and was awarded to Vaughn’s Flying Service Inc. of Reese, MI. This will necessitate a number of adjustments as they will have a different mix of aircraft, capabilities and systems.

The application rates will remain 4 lb/acre granule and 1 pint/acre liquid. Automatic on/off will remain a capability for application to the “cut” portion of aerial blocks.



Summer Operations (May 15 — September 15)

Catch Basins. Catch basin treatments are done primarily to reduce risk of West Nile virus transmission as a prime vector of WNV, *Culex* spp., frequently utilize them for larval habitat. Treatments of catch basins will be scheduled according to larval development. MCMC will use water soluble packet formulations of Altosid rather than pellets or P25 granules in 2020. The cost of treating with WSP is only slightly more expensive and it will ensure more consistent applications and will make application easier for technicians. Altosid XR briquettes will be applied to a select number of high-traffic catch basins so that only one seasonal treatment will be required.

Scrap Tires. Scrap tires produce *Culex* species mosquitoes, *Aedes triseriatus*, *Aedes japonicus* and other species, and are of prime concern as a possible source of West Nile virus bridge vectors. Abate® granules, *Bs*, *Bti* and Mosquiron® pellets will be applied to tires and efforts will continue to support the removal of scrap tires from the environment (see Source Reduction section).

Small Ditch. Pre-treatment of dry ditches will be done with the product Metalarv™ S-PT. Pretreatment allows for material to be placed in ditches that periodically flood and are activated with flooding rains. Following summer rain events there is often abundant area to treat and limited personnel to dispatch; therefore, pretreatment allows crews to focus on areas not already pretreated.

Roadside Ditch. Roadside ditch larviciding will be conducted as usual with continued emphasis on treating *Aedes vexans* after summer rains using *Bti* (Vectobac® 12AS) liquid from truck mounted hydraulic sprayers.

Insecticide	Active Ingredient
Vectobac® G	<i>Bacillus thuringiensis israelensis</i>
Vectobac® 12AS	<i>Bacillus thuringiensis israelensis</i>
Altosid® XR Briquets	Methoprene
Altosid® WSP	Methoprene
Abate® 5%	Temephos
Metalarv™ SP-T	Methoprene
Mosquiron®	Novaluron
BVA-2 MLO	Mineral oil
Evoluer 4-4	Permethrin
Kontrol 4-4	Permethrin

SUMMER LARVICIDING SITES

Site	Description	Treatment Interval	Control Material
Catch Basins	Crocks along city streets	2 - 3 times yearly	Methoprene, <i>Bs</i> or <i>Bti</i>
Roadside Ditches	Ditches along county roads	Following flooding rains	Methoprene, spinosad or <i>Bti</i>
County Drains	Large ditches that transfer water to rivers	As needed	<i>Bti</i>
Small Ditches	Shallow ditches along residential lawns	May-June / after major rains	Spinosad, methoprene or <i>Bti</i>
Seepage Runoff	Small bodies of water high in organic content	Every 10 days as needed	<i>Bti</i> or larviciding oil
Sewage Lagoons	Larger bodies of organic water	Every 10 days as needed	<i>Bs</i> , larviciding oil
Tires	Discarded tires capable of holding water	Twice yearly	<i>Bs</i> , <i>Bti</i> , temephos, novaluron or oil
Containers	Barrels, boats, large trash, etc. holding water	As needed and encountered	<i>Bs</i> , <i>Bti</i> , temephos, novaluron or oil
Ponds	Permanent pools with some open water	As needed (uncommon)	<i>Bti</i>
Flooded Fields	Shallow, temporarily flooded areas	Following major rains	<i>Bti</i> , methoprene or larviciding oil
Cattail March	Cattail marshes and/or brush-covered areas	Following major rains	<i>Bti</i>
Swamps	Permanently-flooded areas with emergent vegetation	As needed	<i>Bti</i>

Mosquito Adulticiding Kontrol 4-4 (permethrin) and Evoluer 4-4 (permethrin) applied with ultra low volume (ULV) technology will be utilized during 2020 adulticide operations. Truck-mounted ULV fogging is conducted evenings during the period of peak mosquito feeding activity as the mosquito population dictates and weather permits. Throughout most of the year this period goes from sunset to midnight, however, spring *Aedes* species and *Aedes vexans* are sometimes most active earlier in the evening. During these times, night-time fogging may begin before sunset. A one-mile no-treatment zone is maintained around known honeybee locations until sunset.

Pre-designated routes, which can provide an estimated 10-day turnaround throughout the county, will be followed. Based on field inspections, landing counts, trap results, resident complaint calls and disease surveillance, treatment will be concentrated in areas where problems persist and reduced in areas with minimal adult mosquito activity. In compliance with Regulation 637, campgrounds and major parks will be permanently posted informing the public that these sites receive periodic treatment to control mosquitoes.

As was initiated in 2019, any long drive requests submitted by residents after 1 May will be considered for route inclusion in the following year's route.

A replacement 4X4 truck was purchased in 2019 and will be obtained and equipped in early 2020. A second Clarke electric ULV unit will be purchased for this truck, for a total of two among the fleet. These units are useful for areas such as campgrounds where people are in close proximity and have limited blockage from the noise given off from the truck unit.

Day-crew technicians will conduct adulticiding with hand-held thermal foggers in special circumstances during the day. Areas that may be treated in this way include city/county parks, and woodlots around suburban areas. A half-mile no-treatment zone is maintained around known honeybee locations while thermal fogging.

LABORATORY OPERATIONS

Encephalitis Virus Surveillance

An active disease surveillance program increases the chance of early detection of virus activity, allowing the most time possible to develop an appropriate response.

Light traps, landing collections and gravid traps will be used to capture adult mosquitoes. VecTOR Test (VecTOR Test Systems, Inc., Thousand Oaks, CA) field test kits will be used to test dead corvids (crows and blue jays) for presence of West Nile virus. Mosquitoes are pooled by species/genera and sent to the Michigan State University lab for testing. The utilization of the MSU lab was made in 2019 due to concern of potential false negatives from use of the VecTOR tests. As stated, the VecTOR kit is still used for bird testing since a higher virus load is generally obtained from the oral swab and false negative results are less likely. Furthermore, use of the VecTOR kits provides immediate results and therefore quick response to WNV positive areas. Results of MCMC surveillance efforts and communication with other agencies will be used in a continuing evaluation of mosquito-borne disease risk as outlined in the CDC guidelines.

Mosquito Surveillance

Adult Mosquito Surveillance Adult mosquito surveillance is used to guide the selection and timing of control strategies and is used in estimation of disease transmission potential. New Jersey Light Traps will be maintained at six locations in Midland County. Collections will be picked up three times weekly. CDC traps will be used in areas not covered by New Jersey traps.

Adult mosquito landing counts are an important tool for determining mosquito biting pressure in various areas and at certain times. These are routinely taken by night shift personnel before beginning evening fogging.

Larval Surveillance The numbers, species and location of immature mosquitoes also influence the selection and timing of control strategies. Biology and field staff will sample many aquatic sites and samples will be returned to the lab for identification. Major emphasis will be placed on sampling the habitat appropriate to each season, i.e. woodlots in the early spring, followed by grasslands and summer sites. Container habitat will be surveyed as often as possible to monitor the presence and range of container breeding species such as *Aedes triseriatus* and *Aedes japonicus*. The Ovi-Catch™ mosquito bucket trap (Catchmaster) will be used in 2020 to monitor for presence of *Ae. aegypti* and *Ae. albopictus* introduction to Midland County. The trap will be placed at the C.M. Rubber processing facility in Coleman, MI and checked weekly or biweekly.

Research. MCMC will be again be assisting in collection of mosquitoes and submission to MSU for resistance testing in 2020. Mosquito specimens for testing for presence of Jamestown Canyon virus will be submitted to MSU again in 2020.

TECHNOLOGY

Midland County upgraded GIS service in 2019 to include the ESRI Enterprise service. Included in this is a dedicated server with GeoEvent capabilities. This will enable premium service and capability and should provide all hardware sufficient for the most enhanced GIS capabilities in mosquito control operations.

The process of moving ESRI projects to the server began in late 2019 and will continue in 2020. Other 2020 goals include establishment of needed databases related to MCMC operations, establishment of attribute rules, development of a data management plan, and establishing viewers, authors, and editing and schema change privileges.

MCMC Biologist Doug Allen in 2019 successfully obtained a pilot license for commercial use of a drone. He has operated the Midland County drone maintained with the IT Department since. Efforts to maintain this competency will be made in 2020 along with efforts to explore ways to use this technology to enhance MCMC operations.

SOURCE REDUCTION

Midland County recognizes that source reduction is one of the most effective ways to control mosquitoes. Through cooperation with and education of property owners and other agencies, many mosquito breeding sites are eliminated or improved. MCMC will schedule and host two scrap tire drives and will continue to encourage property owners to eliminate scrap tires and other mosquito habitat from the landscape. Funding for these drives was sought through a Michigan Department of Environmental Quality scrap tire removal grant. Mosquito Control will also recommend priority areas for drain work to the Midland County Drain and Road Commissions.

COMMUNITY OUTREACH

Community outreach is an important part of the MCMC Integrated Mosquito Management (IMM) program. Property owners are notified of scheduled treatments with direct mailings, telephone notification of local property owners with special security needs, postings on social media and websites and door-to-door personal contacts. Print and display advertising are purchased throughout the year to notify County residents of control operations and to direct residents' questions and concerns. Presentations are provided to community groups on request. The MCMC website, phone directory menu options and a website and Facebook page provide up-to-date treatment schedule information and news on MCMC operations.

FACILITY UPGRADES

The Board of Commissioners approved a capital project at MCMC to install a separate gravel driveway that loops around south of the facility. Also included in this project are plans to install a lean-to for equipment storage and expansion of the southeast parking lot. This project will be incorporated into a greater long-term facility plan.