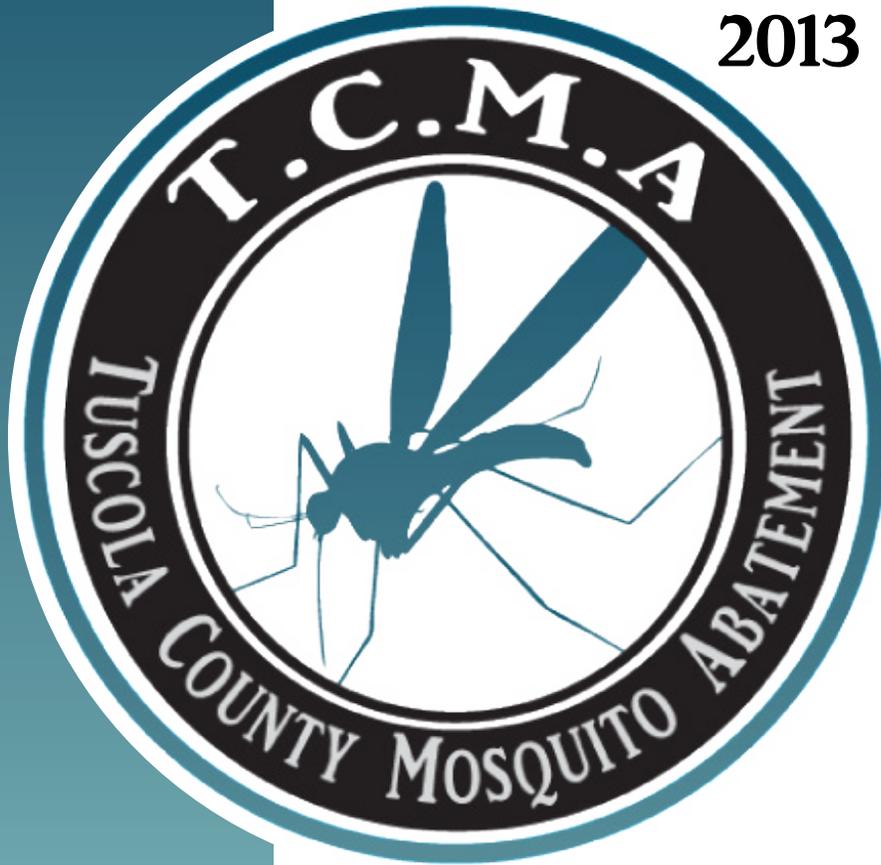


2012 ANNUAL REPORT

2013 PROGRAM PLAN

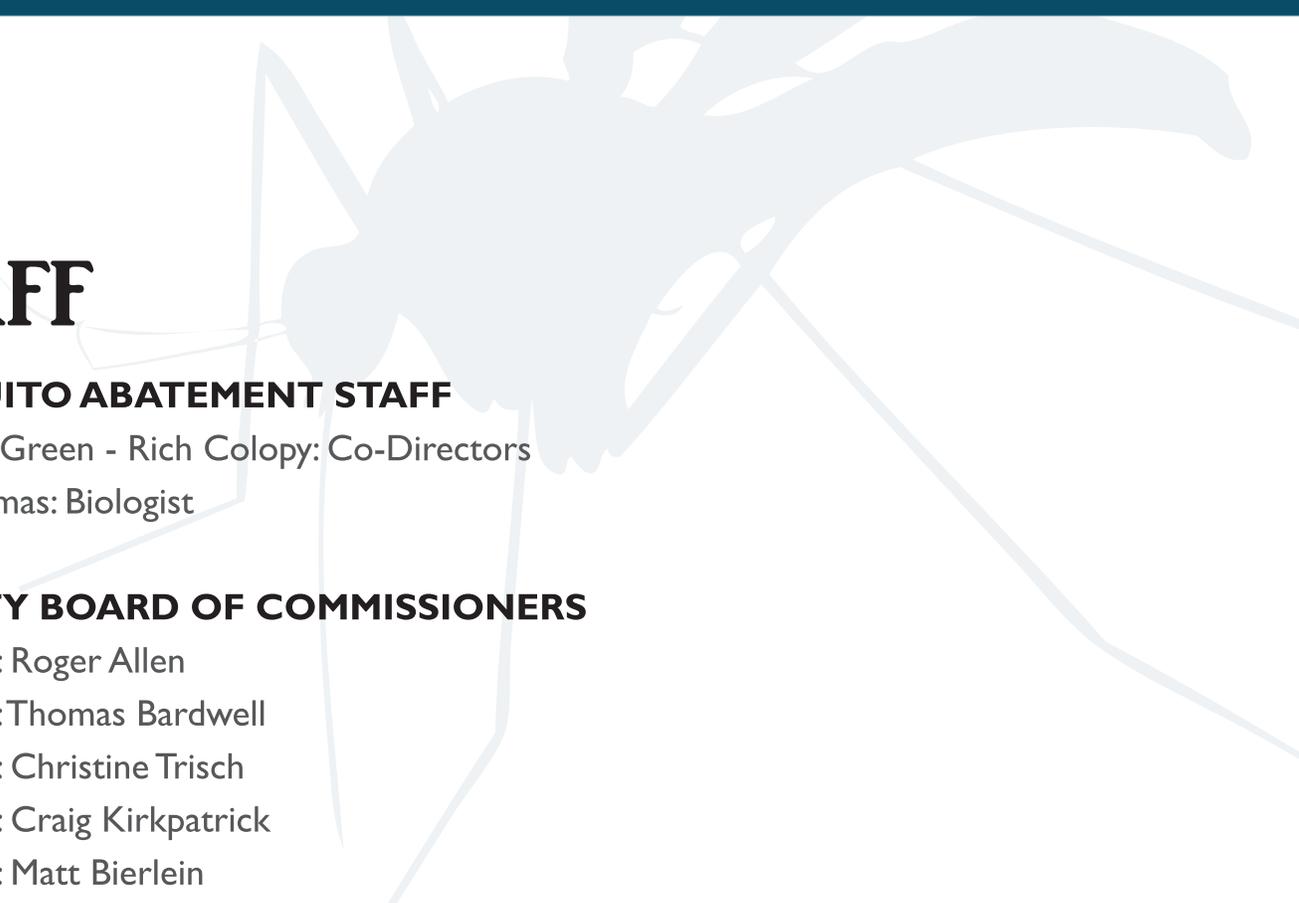


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STAFF



MOSQUITO ABATEMENT STAFF

Kimberly Green - Rich Colopy: Co-Directors

Tony Thomas: Biologist

COUNTY BOARD OF COMMISSIONERS

District 1: Roger Allen

District 2: Thomas Bardwell

District 3: Christine Trisch

District 4: Craig Kirkpatrick

District 5: Matt Bierlein

COUNTY ADMINISTRATION

Michael Hoagland, County Controller

CONSULTANTS

Edward Walker, Ph.D., Michigan State University

Richard Merritt, Ph.D., Michigan State University

Michael Kaufman, Ph.D., Michigan State University

TECHNICAL ADVISORY COMMITTEE

COMMITTEE MEMBERS

John D. Bacon	Saginaw Valley Beekeepers Association
Norma Bates	Tuscola County Board of Commissioners
Mike Krecek	Midland County Health Department
Cynthia Chilcote	Midland County Resident
Barb MacGregor	Bay County Health Department
Doug D. Enos	Midland County Drain Commission
Erik S. Foster	Michigan Department of Community Health
John Hebert	Bay Regional Medical Center
Roger Allen	Tuscola County Board of Commissioners
John Hill	Michigan Department of Agriculture
Joseph Rivet	Bay County Drain Commission
Richard Somalski	Bay Landscaping

ORGANIZATION

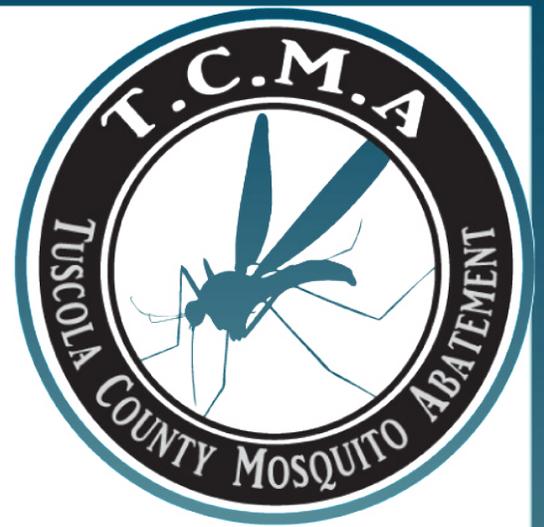
The Tuscola County Mosquito Abatement (TCMA) district was originally formed in 1997, after a millage proposal was passed by the citizens of Tuscola County. The millage was renewed in 2008 for a period of six years. Funding for the 2012 mosquito control season was collected during the winter 2011 taxes, at a rate of 0.65 mils.

Tuscola County is one of four counties in Michigan with a formal, comprehensive mosquito control program. TCMA is a county governmental agency which serves to

control nuisance and disease vectoring mosquitoes. A Technical Advisory Committee (TAC) composed of some of Michigan's leading biologists, entomologist, conservationists and scientists, review TCMA's program every March.

“Tuscola County is one of four counties in Michigan with a formal, comprehensive mosquito control program.”

Mosquito Abatement is based on Integrated Pest Management (IPM) practices. IPM is generally broken down into five categories



or steps. These steps include: identification of the pest, understanding of the pest's biology, monitoring the pest, developing sound goals to manage the pest, and implementation of an IPM program.

Biological surveillance, disease surveillance, product evaluations, field operations, and public education are included in this program.



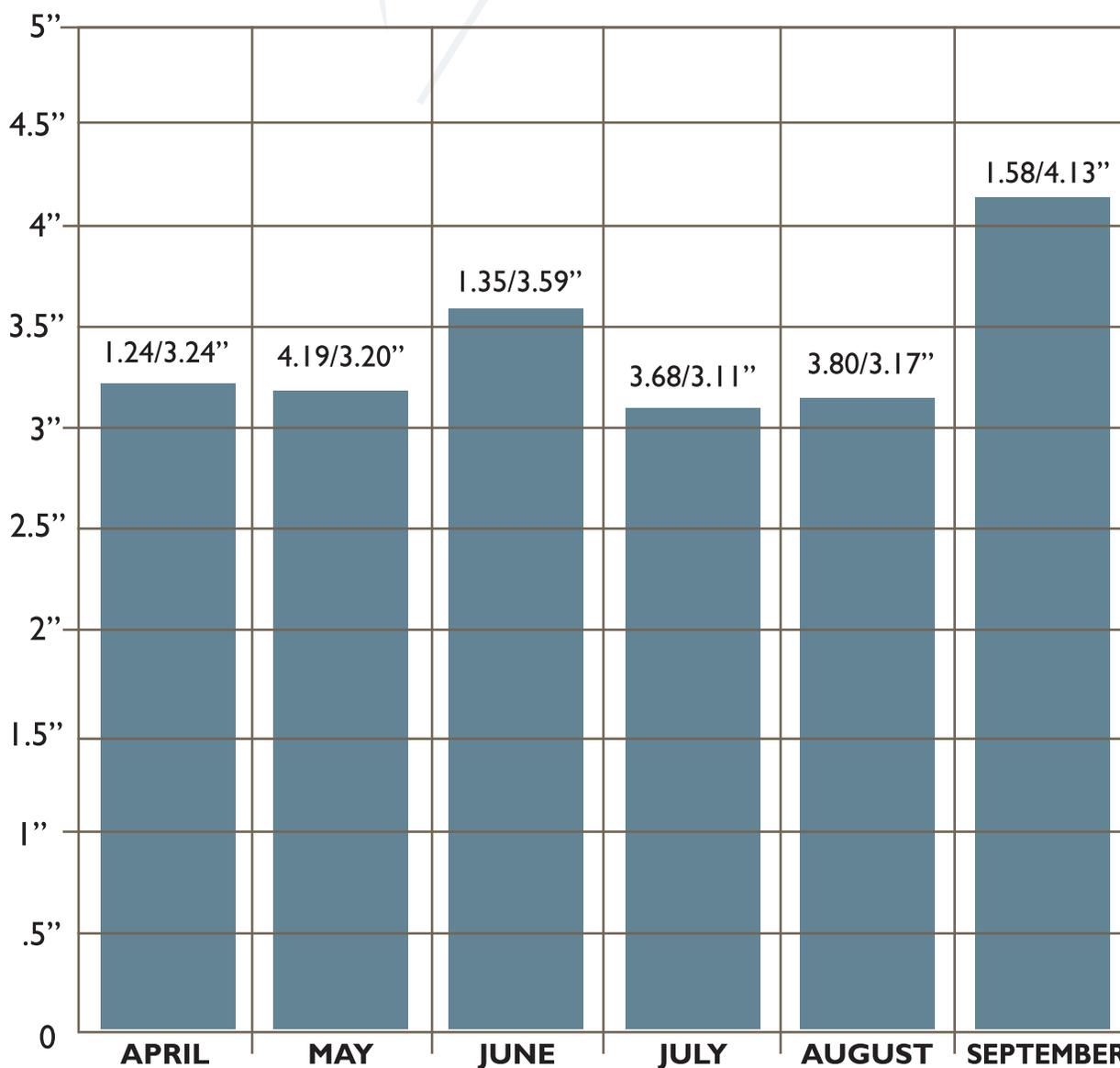
WEATHER PAGE

Rainfall, when it occurs, and in what amounts, is essential in determining the population of many mosquito species. Heavy rains, especially during the warmer months, can result in explosions of hatches.

Only one rain event met that criterion in 2012. A two-day deluge in August produced heavy numbers of *Aedes vexans*. Otherwise the pattern of below-average rainfall continued for most of the summer, resulting in record low trap counts.

2012 RAINFALL TOTALS

Actual/Normal 15.84/20.44"



BIOLOGY

The Biology department is responsible for observing and reporting mosquito population levels, species identification, disease testing, product analysis, and recording weather data.



During 2012, seven locations hosted New Jersey Light Traps (NJLT) from early May until late September. These sites were located throughout Tuscola County to assist in determining mosquito population densities and possible disease transmission. We will utilize many of the same locations for the 2013 season. Gravid and CDC traps were also set out at selected locations throughout the summer months.

Trapping started on April 9th, and continued through October 1st. Trap collections are sorted, and identified to sex and species. Female mosquitoes that belong to species known to transmit disease are then packaged and sent to Michigan State University for testing. A total of 159 mosquito pools, consisting of 3,180 individual mosquitoes, were submitted to the arboviral disease testing laboratory at MSU. *Coquillettidia perturbans* collected were tested for Eastern Equine Encephalitis (EEE).

Culex pipiens, *Culex restuans*, *Ochlerotatus japoni-*



cas, and *Aedes triseriatus* samples were all tested for West Nile Virus (WNV), with selected samples also tested for St. Louis Encephalitis (SLE).



The biology department also selected 31 pools of *Culex pipiens* and *Culex restuans*, to be tested in-house, utilizing VecTest® kits. We also used this method to test four crows. All in house samples tested negative. During the 2012 mosquito control season, there were two positive WNV samples reported in Tuscola County.

GRAVID DATA

GRAVID TRAP 2011 TOTALS

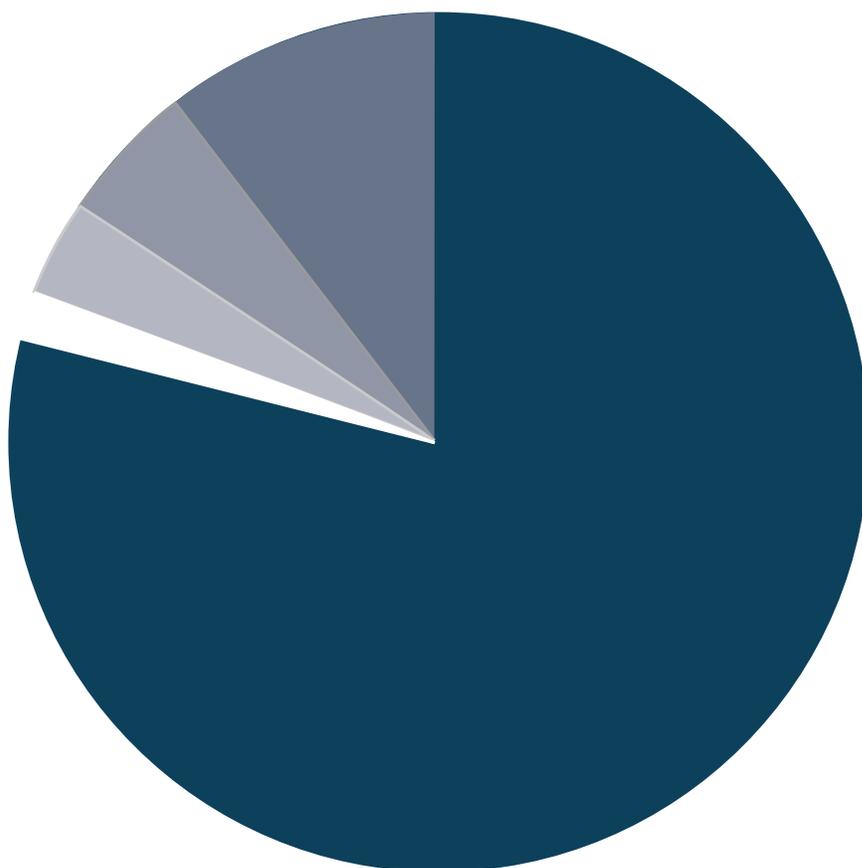
CULEX FEMALES	2953
OTHER	24
MALES	238
TOTAL	3215

CDC DATA



TUSCOLA COUNTY CDC DATA

- COQUILLETTIDIA
- ANOPHELES
- CULEX
- OTHER
- AEDES



2012 CDC & GRAVID

SPECIES	CDC	GRAVID
CANADENSIS	277	
IMPLICATUS	45	
STIM/FITCH	167	
TRISERIATUS	1	1
TRIVITTATUS	382	2
PROVOCANS	11	
JOPONICUS		11
CINEREUS	63	
VEXANS	263	4
PUNCTIPENNIS	69	3
QUADRIMAC.	8	2
WALKERI	4	
INORNATA	20	
MINNESOTAE		
MORSITANS		
MELANURA		
PIPIENS	39	2359
RESTUANS	13	594
TARSALIS		
TERRITANS		
PERTURBANS	16.3	1
CILIATA		
SAPPHARINA		
DAMAGED	19	0
TOTAL FEMALE	1526	2977
MALES	36	238
AVG.CATCH	35	27

NJ LIGHT TRAP



SPECIES	LOC.1	LOC.2	LOC.3	LOC.4	LOC.5	LOC.6		
	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER		
CANADENSIS		17						
IMPLICATUS		8		1				
STIM/FITCH	2	148	52	33	2			
TRISERIATUS			3	5				
TRIVITTATUS		21	47	53	44	21		
PROVOCANS								
JOPONICUS				3	4			
CINEREUS		16	28	24	20	13		
VEXANS		173	463	727	1936	960		
PUNCTIPENNIS		58	39	120	90	51		
QUADRIMAC.	1	21	267	714	401	157		
WALKERI		1	38	110	54	20		
INORNATA	5	38	1	2	1	3		
MINNESOTAE								
MORSITANS		1	1					
MELANURA		4						
PIPIENS	12	54	51	228	185	238		
RESTUANS		22	10	12	7	5		
TARSALIS								
TERRITANS			7	3	7	13		
PERTURBANS		1	111	190	1			
CILIATA			1	2	1			
SAPPHARINA	3	5	5	1	2			
DAMAGED		21	20	20	21	14	96	
TOTAL FEMALE	20	358	1123	2231	2755	1484	8196	
MALES	3	432	528	691	1193	773	3570	
							11363	
							+4796 (cdc&grav)	
							16,659	

(previous low:20,130 / 2006)

LARVICIDING

Flooded woodlot larviciding started on April 2nd, targeting the spring *Aedes* mosquitoes. Technicians applied granular BTI and BVA oil, in seasonally flooded woodlots where mos-



quito larvae were present.

This is the earliest evidence of larval



(first found on March 13th) and pupal (first found on March 28th) development on record.



Biology staff and larviciding crews conducted routine surveillance and quality control on 3,542 flooded woodlot sites that were completed during the 2012 control season.



LARVICIDING

Tuscola County is home to nine sewage lagoon sites. Many of these sites have historically been known breeding sites. Each of these sites was checked and treated if necessary throughout the 2012 season, using liquid BTI or Granular BS.

In addition to the sewage lagoon treatment, summer larviciding entailed treatment of:

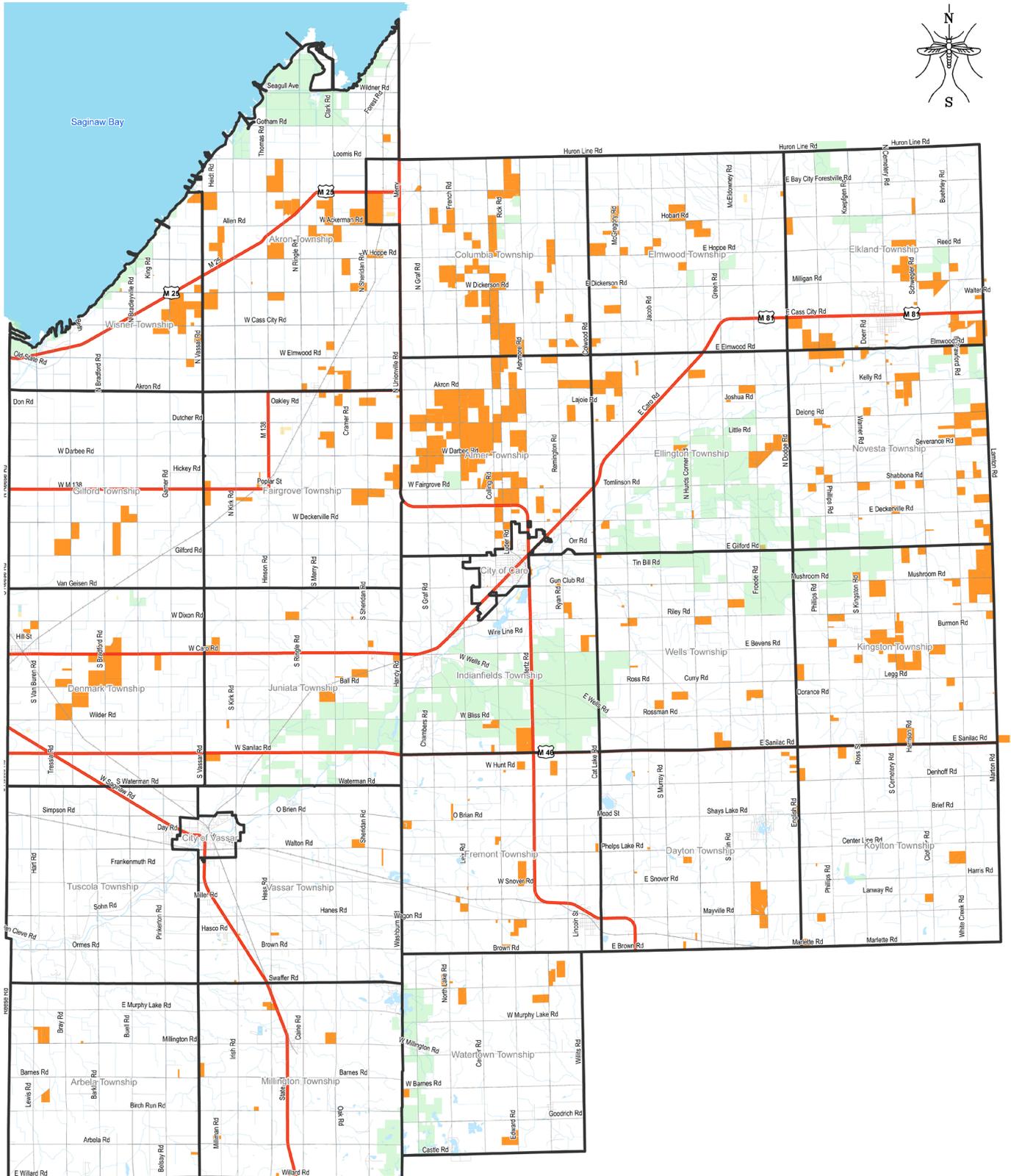
- Roadside ditches treated on average 4-8 times per township depending on the need, using liquid BTI.
- Cross Country ditches, were treated using granular BTI.
- Catch Basins were treated three times during the 2012 season using granular BS.
- Flooded Fields were treated during the summer using granular BTI.
- Artificial containers and tires were also treated using granular BTI.

For the 2013 control season, we will continue to educate the citizens about the numbers of mosquitoes that abandoned tires and other containers produce, many of which are known to be vectors of mosquito-borne disease.

We hope to encourage these citizens to remove the tires on their property, and to empty these containers.



TUSCOLA COUNTY



ADULTICIDING

Each of the 23 townships as well as the villages and cities in Tuscola County, were routinely treated during the 2012 season with truck mounted ULV units. Permethrin was applied at a rate of five ounces per minute.

We performed 2,590 “yard jobs”, down from 3,536 in 2011.

This number reflects the public use areas (parks, golf courses, rail trails, gun and archery

clubs) that were treated on a routine basis with our mule.

Foremen and biology technicians reported in March in order to verify mapping information and assess long driveway requests. The treatment route maps were then routinely updated as needed.



In 2012, we had 13 technicians on the evening shift, with trucks maintaining a nightly presence in most townships. Technicians were assigned specific townships, so as to familiarize themselves with any special conditions. For instance, Tuscola is home to many organic farms, making it imperative to know where these and other “no sprays” exist.



TIRE PAGE

In collaboration with the Tuscola County Recycling Center and various townships, we hosted fifteen tire collection sites throughout the County.

We plan to match that number in 2013, with one of these to be held at Mosquito Abatement.

Technicians will begin handing out flyers with the dates and times of these collection sites to residents during the spring, as well we post these dates in the paper and on our facebook page and website.

LONG DRIVEWAY PROGRAM



We realize that many homes in Tuscola County are set back from the country road, and subsequently, shielded somewhat from the effects of the roadside adulticiding operations. If requested by the owners, their property will be reviewed to see if it meets the criteria for the Long Drive program. Property with a house (primary residence) meeting the established requirements may be placed on the long driveway list. The driveway in question will be marked by a long drive stake that has a reflective band on top. These stakes will be placed by the agency; however homeowners are asked to remove them in the fall to avoid damage or loss from snow removal

equipment, and then replaced in the spring. These stakes aid our technicians in finding the drive during the nighttime treatment. These drives are also marked on our spray maps. The basic criteria for a home to be placed on the long drive list are:

- There must be a primary residence on the property and the front of the home must be 300 feet away or greater from the edge of the roadway
- There must be an adequate turnaround for our truck that does not include driving across any lawn areas.
- The driveway must be passable with two wheel drive vehicles.

- The drive area must have significant vegetation providing areas of mosquito harborage.

Other factors such as sensitive locations, for example No sprays or Organic Farms adjacent to the property, may exclude the property from treatment except under specific conditions.

In 2012 we held an open enrollment period for the long driveway program, from March – May adding 21 residents. Tuscola County currently has 225 residents on the Long Drive Program.

PUBLIC EDUCATION

The goal of TCMA's public education program is to make residents informed of mosquito habitat and life cycle. This will help citizens be aware of how to prevent and eliminate breeding sites for disease carrying mosquitoes. Informed residents can be integral in creating a safe and disease-free environment. When

mosquito populations are high, residents can identify the source or reason for the increase. They will also be aware of the steps they can take to reduce mosquito related problems and prevent breeding sites on their property. This task is completed in many different ways. Two of the most important ways TCMA

distributes this information are through citizen phone calls to our office, and face-to-face contact with our technicians, as well as our Facebook page. The technicians also carry brochures with them and are encouraged to distribute them to homeowners.

MEMBERSHIP

TCMA staff are required to obtain and maintain licensing through the Michigan Department of Agriculture (MDA) as certified pesticide applicators in both the Core Category and 7f (Mosquito Control). To assist our technicians and ensure proper training, a two day training/seminar will be held March 1st and 2nd, with

MDA available onsite for testing during the morning of the second day. In order to stay abreast of current developments, the permanent staff of TCMA are also encouraged to attend conferences, classes, and seminars relating to mosquito biology and control. TCMA's Technical Advisory Committee (TAC) also

provides new insight and important data in the areas of Biological Environmental Sciences. TCMA permanent staff also maintain memberships and are active in the Michigan Mosquito Control Association (MMCA) and the American Control Association (AMCA).

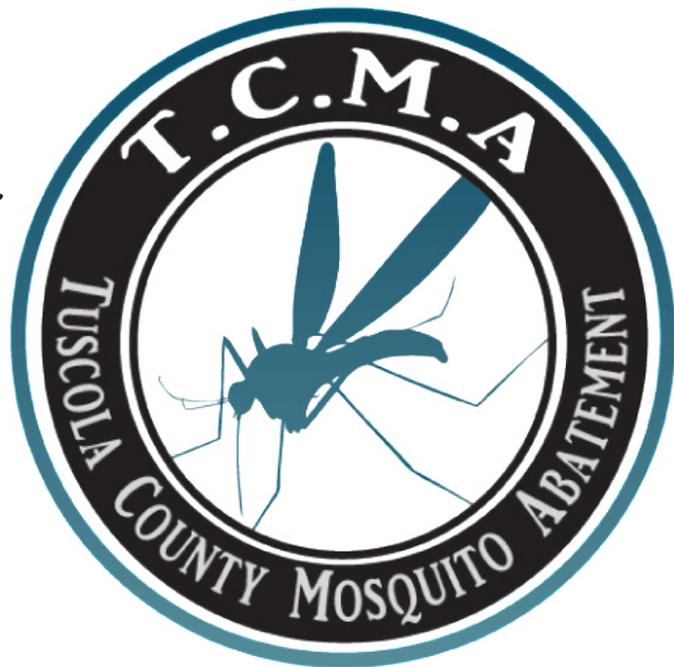
2012 COMPLETED PROJECTS

- Completed building renovations
- Addition of employee parking lot lighting
- Replaced five trucks
- Purchased one ULV unit
- Implemented new data storage and backup
- Expansion of Long Drive Program
- Explored new sites for satellite tire collection
- Addition of computerized training materials
- Completed electrical upgrades to building

2013 OBJECTIVES

- Purchase four new trucks, completing the updating of the fleet.
- Purchase two new ULV units
- Purchase one Colt prototype
- Order new computer and printer for lab.
- Purchase tables and chairs for meeting room
- Plan training and testing for employees
- Attend MMCA
- Begin expansion plans
- Trials of new products

2012 MOSQUITO ABATEMENT CREW





**TUSCOLA
COUNTY
MOSQUITO
ABATEMENT**

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Phone 989-672-3748

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