



Skeeter Scanner

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Presidents Message

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EDUCATION COMMITTEE
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Ahh, 2009 and the hope for better things!! While it is cold outside I would like to reflect back on 2008 for a moment. As I asked in the last newsletter, who would of thought that Michigan would be affected by a hurricane let alone two of them? These storms made a dynamic end to a busy mosquito season. The past year brought a change in the political and economic climate as well. Gas prices went sky high then settled back to “reasonable” rates as the bottom dropped out of the economy. And don’t get me started on the financial institutions bailout with their executives’ golden parachutes.



Undeniably 2009 budgets will be tight, and as communities try to cope with reduced revenues many political officials will perceive mosquito control as a supplementary service. As a group it is our obligation to remind them of the important benefits of mosquito control. West Nile virus has become endemic across the United States and is here to stay in Michigan. With background human case numbers in the teens to twenties all that would be required for the virus to explode into an epidemic again is the right enviromental conditions. Likely, human case totals would not reach the 2002 levels but there would be highly significant numbers and in my opinion one West Nile case is one too many. Along with decreased risk of disease, remember to promote the fact that control programs provide reduced annoyance and added comfort for outside activities. Also, economically, mosquito control programs promote tourism. Who in their right mind would visit a recreation area where it is impossible to stay outdoors if one is available to enjoy mosquito free?

It is January so remember to send in your registration for our 23rd annual conference in Ann Arbor to be held on February 4-5. Also, reserve your motel room by January 21 as rooms after that date are subject to regular room rates. Joyce McLaughlin and the planning committee have been hard at work putting together a great program. Looking at the tentative agenda it is obvious that conference attendees will be treated to some world renowned speakers and pertinent topics.

Again this year MMCA will be promoting a silent auction. Proceeds are used to help sponsor the scholarships and MMCA’s education programs. If you would like to donate any silent auction items please contact Melinda Moreno at (989) 894-4555 or morenom@baycounty.net. Also, please remember to email photo salon photos to Tom Wilmot at twilmot@co.midland.mi.us. I look forward to seeing you in Ann Arbor (Go Blue!!!!, oops did I really say that).

Charles Dinsmore

One Health

The convergence of people, animals, and our environment has created a new dynamic—one in which the health of each group is inextricably interconnected. The challenges associated with this dynamic are demanding, profound, and unprecedented. While the demand for animal-based protein is expected to increase by 50% by 2020, animal populations are under heightened pressure to survive, and further loss of biodiversity is highly probable.

Compounding this is the fact that, of the 1,461 diseases now recognized in humans, approximately 60% are due to multi-host pathogens characterized by their movement across species lines. And, over the last three decades, approximately 75% of new emerging human infectious diseases are defined as zoonotic. Our increasing interdependence with animals and their products may well be the single most critical risk factor to our own health and well-being with regard to infectious diseases.

Although new opportunities have emerged to promote health in the rapidly changing human, animal, and environment domains, our ability to protect, improve, and advance health cannot be based on strategies and mindsets in the past. Rather, we need to adopt an integrated, holistic approach that reflects both our profound interdependence and the realization that we are part of a larger ecological system, exquisitely and elaborately connected.

The strategy of the One Health initiative is to better understand and address the contemporary health issues created by the convergence of human, animal and environmental domains. The term One Health has been defined by the One Health Task Force as the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals, and our environment. Achieving the end point of One Health is truly one of the critical challenges facing humankind today.

Central to the concept of One Health is the control of infectious diseases which have helped shape the course of human history. There is every indication that infectious diseases will continue to have a significant impact on our health, and the emergence and re-emergence of pathogens will threaten the

health and well-being of people and animals throughout the 21st century.

Numerous examples point to the critical need to address these threats, including:

The spread of HIV-AIDS, a zoonotic disease with its origin in non-human primates, which has had a severe impact on life expectancy and human health, especially in Africa.

The incursion of West Nile Virus in 1999, and SARS and monkeypox in the US in 2003—although none of these had ever been found in the Western Hemisphere in prior years.

The infection of over 1.5 million individuals in the US by West Nile Virus, as well as countless horses and birds, permanently changed the landscape of human and animal medicine in this country.

The emergence of Bovine Spongiform Encephalopathy (BSE), now recognized as a disease produced by an aberrant protein, has changed the standards of global agricultural trade as well as how cattle are fed. This disease is also recognized as a food-borne human pathogen producing new variant Creutzfeld-Jakob Disease (vCJD) in humans.

The words of Dr. Gro Harlem Brundtland, former director of the World Health Organization (WHO), were indeed prophetic. In her speech at the United Nations Global Leadership Awards on April 19, 2001, she stated that in a modern world, bacteria and viruses travel almost as fast as money. With globalization, a single microbial sea washes over all humankind and there are no health sanctions. In actuality, that sea washes not over just all humankind, but also across all animal and environmental domains.

There is nothing on the horizon to suggest that any of these factors are abating. In fact, these factors are likely to accelerate in intensity and complexity, and will surely create consequences and implications of unprecedented scope and scale and global economic devastation much greater than any previous time in history. By adopting the tenets of One Health, we can devise integrated strategies to control that sea and prevent these threats from crossing domains.

Bird Diversity Lessens Human Exposure To West Nile Virus

This one's for the birds.

A study by biologists at Washington University in St. Louis shows that the more diverse a bird population is in an area, the less chance humans have of exposure to West Nile Virus (WNV). "The bottom line is that when there are more bird species in your backyard, you have much lower risk of contracting West Nile fever," said Brian Allan, doctoral candidate in Biology - Arts & Sciences at Washington University in St. Louis. "The mechanisms are similar to those described for the ecology of Lyme disease. Most birds are poor reservoirs for West Nile Virus, and so mosquito bites taken on them are 'wasted' from the perspective of the virus. Where many bird species exist, very few mosquitoes get infected, and so we humans are at low risk. A few bird species are highly competent reservoirs, and these tend to occur in urbanized and suburbanized areas where bird diversity suffers."

The most common "reservoir" species that urbanites and suburbanites and even rural dwellers in heavily farmed landscapes see are crows, grackles, house finches, blue jays, sparrows and American robins, with the robin being the most prolific carrier of WNV. Robins are anthropophilic — they love being around humans — and it's relatively easy for mosquitoes to take their blood meals from them because robins feed so much on the ground.

While diversity of bird species is important in this scenario, that factor alone doesn't tell the whole story." It's not just about the number, but their relative proportions," Allan said. "It's a combination of richness - the number of species — and evenness — their relative proportions. In urban and suburban areas you see lower species richness and lower community evenness. For instance, you might have five species present, but in 100 animals 90 are just one species. That's why species number is only half the equation."

Allan and numerous graduate students began the research five years ago as they just entered graduate school and the topic of West Nile Virus was just beginning to receive lots of attention and the ecology of the organism hadn't been studied much. They

identified a variety of field sites, both urban and rural, with their base of operations at Washington University's Tyson Research Center.

They performed bird surveys at the sites, put up a variety of mosquito traps and studied different mosquito species and their ability to transmit the virus. Using kits provided by the Center for Disease Control, they tested the mosquitoes and found three positive pools. "The infection rates are actually remarkably low, with maybe one in 1,000 carrying WNV," Allan said.

They expanded their study to include mosquito infection data from the St. Louis City and St. Louis County Health departments. They saw the same patterns. The greater bird diversity, the lesser incidence of WNV; the lesser diversity, the greater likelihood of WNV.

To broaden their finding even more, Allan and his colleagues used national data sets on human cases of WNV and a tool called the Shannon Diversity Index to estimate the diversity of bird populations across the U.S. These data are conducted nationwide by amateur bird watchers for the United States Geological Survey's Breeding Bird Surveys.

"We're seeing locally and nationally that bird diversity is a buffer against the occurrence of West Nile Virus in humans," Allan said. "That's a win-win situation for both conservation and public health."

A Human-Health Risk Assessment for West Nile Virus and Insecticides used in Mosquito Management

West Nile Virus (WNV) has become a major public health concern in North America since 1999 when the first outbreak in the Western Hemisphere occurred in New York City. As a result of this ongoing disease outbreak, management of mosquitoes which vector WNV throughout the U.S. and Canada has necessitated using insecticides in areas where they traditionally have not been used, or have been used less. This has resulted in concerns by the public about the risks from insecticide use. The objective of this study was to use reasonable worst-case risk assessment methodologies to evaluate human-health risks for WNV and the insecticides most commonly used to control adult mosquitoes.

They evaluated documented health effects from WNV infection and determined potential population risks based on reported frequencies. Potential acute (1 day) and subchronic (90 day) multi-route residential exposures were determined from each insecticide for several human subgroups. They then compared potential insecticide exposures to toxicological and regulatory effect levels. Risk quotients (RQ's, the ratio of exposure to toxicological effect) were less than 1.0 for all subgroups. Acute RQ's ranged from 0.0004 to 0.4726. Subchronic RQ's ranged from 0.00014 to 0.2074. Results from the risk assessment and the current weight of scientific evidence suggest that human-health risks from residential exposure to mosquito insecticides are low and are not likely to exceed levels of concern. Further results suggest that, based on human-health criteria, the risks from WNV exceed the risks from exposure to mosquito insecticides.

The complete report can be accessed at:
<http://landresources.montana.edu/WNV/Petersonetal2006.pdf>

Researchers Discover how Mosquitoes Avoid Succumbing to Viruses they Transmit

Mosquitoes are like Typhoid Mary. They can spread viruses which cause West Nile fever, dengue fever, or yellow fever without themselves getting sick. Scientists long thought that the mosquito didn't care whether it had a virus hitchhiker, but have now discovered, "There is a war going on," said Zach Adelman, assistant professor of entomology at Virginia Tech.

The war is at the cellular level, between the host and invading RNA – the strands of code that produce different kinds of viral proteins.

The mediators that balance the interactions between mosquito and virus are virus-derived short-interfering RNAs (viRNAs), which are generated by the mosquito's immune response to infection. "If the mosquito is not able to cut up the virus genome into viRNAs, an otherwise invisible infection becomes fatal-- for both the mosquito and the virus. In other words, to complete the circle and be transmitted back to a vertebrate host, the virus must submit, to some extent, to the mosquito's antiviral response," said

Kevin M. Myles, assistant professor of entomology at Virginia Tech.

"We asked, "How is it that the mosquito can control the pathogenicity of these viruses so well, while humans with our more complex immune systems, often develop disease when infected?" said Myles.

The researchers used the arthropod-borne virus Sindbis - a model virus for a wide variety of mosquito-transmitted viruses, such as chikungunya and eastern equine encephalitis, both of which cause serious diseases in humans. They infected *Aedes aegypti* mosquitoes, an important vector of yellow fever and dengue. In response, the mosquito immune system generated viRNAs, which made up 10 percent or more of total cellular small RNAs. "The proportion of the small RNAs that are viRNAs was surprising," the article stated.

The researchers then altered the Sindbis genome so that it would carry a protein known to suppress the ability of a cell to cut up virus genomes into viRNAs. "We can't yet knock-out the mosquito's immune response, so we had to alter the virus," Adelman said.

The discovery provides a potential target for fighting mosquito-borne diseases – by upsetting the balance so the virus kills the mosquito. "We didn't know it was possible to unleash this kind of pathogenic potential in the mosquito," Myles said. "We would still have mosquitoes biting us, but they would not be transmitting viruses," said Adelman.

The article, "Alphavirus derived small RNAs modulate pathogenesis in disease vector mosquitoes," by Myles; Michael R. Wiley of Ambler, Pa.; Elaine M. Morazzani of Vienna, Va.; and Adelman, was published in the *Proceedings of the National Academy of Sciences*.

Blood from Mosquito Traps Finnish Suspect

Police in Finland believe they have caught a car-thief thanks to a DNA sample taken from a sample of his blood found inside a mosquito.

"A police patrol carried out an inspection of the car and they noticed a mosquito that had sucked blood. It was sent to the laboratory for testing, which showed the blood belonged to a man who was in the police registers".

Thursday, February 5, 2009

- 12:00 pm Refreshments & Snacks Available**
Sponsored by Bruce Russell, AllPro Vector Group
& Larry Metzger, B & G Chemical and Equipment
- 1:00 pm Urban Integrated Pest Management**
Robert England
Michigan Pest Control Association
- 1:15 pm Effectiveness of ULV Spraying in Rural Areas
Against Spring Aedes Mosquitoes**
Randall Knepper
Saginaw County Mosquito Abatement Commission
- 1:30 pm An Environmental Partnership: Wheaton Mosquito
Abatement District and Clark Environmental Sciences**
Jim McNelly
Clarke Environmental Sciences
- 1:45 pm Assessment of the Potential for treating Cattle with
Avermectins for Suppression of Malaria Mosquitoes**
James Miller, PhD
Michigan State University
- 2:00 pm Updates from Environmental Protection Agency
of Interest to Vector Control Professionals**
Donald Baumgartner
US EPA
- 2:20 pm The Blacklegged Tick (*Ixodes scapularis* Say) in Indiana:
A Review and Outlook for the Future**
Robert Pinger, PhD
Ball State University
- 2:35 pm Searching a Smaller Haystack:
Strategies for Control of Host-Seeking Ticks**
Lee Mitchell
Toledo Area Sanitary District
- 2:50 pm Concluding Remarks**
William Stanuszek, MMCA President – 2009

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Four Points by Sheraton Ann Arbor
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www.fourpointsannarbor.com
(734) 996-0600

Michigan Mosquito Control Association
23rd Annual Conference Tentative Agenda
Four Points by Sheraton, Ann Arbor
February 4-5, 2009

Wednesday, February 4, 2009

- 8:00 am Registration**
Complimentary mugs and refreshments provided by
Albert & Michael Schiffer, Al's Aerial Spraying
- 9:00 am Welcome**
Charles Dinsmore, MMCA President – 2008
- 9:10 am Keynote Address:
Malaria Vector Control for Eradication**
Graham White, PhD
US Armed Forces Pest Management Board
- 10:00 am Oviposition by Ochlerotatus (*Aedes*) japonicus
in Artificial Habitats in Michigan**
Michael Kaufman, PhD
Michigan State University
- 10:20 am Coffee & Rolls Available**
Sponsored by David Driver, Univar USA
- 10:50 am Gypsy Moth & Other Invasive Species in Michigan**
Alicia Wallace
Bay County Gypsy Moth Suppression Program
- 11:05 am The Ecology of Buruli Ulcer**
Mollie McIntosh, PhD
Michigan State University
- William J. Lechel, II Memorial Scholarship Student Presentation**
Sponsored by Jake Britton, Clarke Mosquito Control
& Greg Seago, Advanced Pest Management
- 11:25 am Buruli Ulcer Research**
Ryan Kimbiruaskas
Michigan State University
- 12:00 pm Lunch (on your own)**

Recertification Credits will be
available for:
MDA Category 7F and Core
Michigan Environmental Health

Wednesday, February 4, 2009

- 1:05 pm** **Effects of Pacific Salmon on Stream and Riparian Communities in SE Alaskan Streams**
Richard Merritt, PhD
Michigan State University
- 1:25 pm** **2008 Arbovirus Surveillance in Michigan**
Erik Foster
Michigan Department of Community Health
- 1:55 pm** **Mosquito-borne Diseases in Ohio**
Richard Gary, PhD
Ohio Department of Health
- 2:15 pm** **London Ontario Experience**
Jeremy Hogeveen
Middlesex-London Health Unit
- 2:35 pm** **Emergency Aerial Response to Flooding in Lake Delton, Wisconsin**
Jake Britton
Clarke Mosquito Control
- 2:55 pm** **Field Guide to Common Mosquito Species**
Thomas Wilmot, PhD
Midland County Mosquito Control
- 3:05 pm** **Review Mosquito Identification - Refreshments Available**
Sponsored by Jason Trumbetta, Adapco
- 3:30 pm** **Deployed Warfighters Program**
Captain Stanton Cope, PhD
U.S. Armed Forces Pest Management Board
- 3:55 pm** **Zenivex – A New Active Ingredient**
Loren Cunningham
Central Life Sciences
- 4:15 pm** **Precipitation Events and West Nile Virus Dynamics in Northeastern Illinois**
Mike Szyzka
Northwest Mosquito Abatement District
- 6:00 pm - 10:00 pm** **Banquet/Entertainment**
Refreshments sponsored by Jake Britton, Clarke Mosquito Control

Thursday, February 5, 2009

- 8:00 am** **Coffee & Rolls Available**
Sponsored by Ryan Solberg, Valent BioSciences
- 8:15 am** **Annual MMCA Business Meeting & Election of 2009 Board of Directors**
- 9:00 am** **Bed Nets for Control of Malaria in Kenya**
Edward Walker, PhD
Michigan State University
- 9:20 am** **Michigan Department of Agriculture Update**
Brian Rowe
Michigan Department of Agriculture
- 9:40 am** **AMCA Update**
Thomas Wilmot, Regional Director
American Mosquito Control Association
- 10:00 am** **Coffee & Rolls Available**
Sponsored by Greg Seago, Advanced Pest Management
- 10:25 am** **Potomac Horse Fever**
Nancy Frank, DVM
Michigan Department of Agriculture
- 10:45 am** **Promoting Quality in a Control Program**
William Stanuszek
Saginaw County Mosquito Abatement Commission
- 11:00 am** **Woodland Pool Wildlife**
Mary McCarry
Bay County Mosquito Control
- 11:15 am** **Personal Protective Equipment**
William Wallace
Tuscola County Mosquito Abatement
- 11:30 am** **Citizen Call System and Web Map Links**
Nancy Read, PhD
Metropolitan Mosquito Control District
- 11:45 am** **An Overview of the Sentinel GIS System**
Larry Metzger
B & G Chemical and Equipment Company

Ruling Allows Suffolk to Continue Mosquito Program

Tossing a lawsuit that could have significantly scaled back Suffolk County's mosquito control program, a federal judge has ruled that pesticides and dredge spoils that end up in local waters as a result of the program do not violate the Clean Water Act.

The suit by Peconic Baykeeper, a local environmental advocacy group, said the mosquito control program dumped pollutants into bays and wetlands without the proper permits. The suit also said Suffolk improperly used chemicals that target adult mosquitoes by spraying them over open water, in contradiction of label instructions. The 2004 suit, which went to trial this spring, is one of several legal challenges the group has mounted.

U.S. District Judge Arthur Spatt dismissed the case in a Nov. 17 decision that highlighted the public health threat posed by West Nile virus, which has been blamed for four Long Island deaths this year. "The legally permissible spraying in this case, in this area

of Suffolk County, is a permissible response to that continuing threat," Spatt wrote.

The ruling said Suffolk did not need additional permits for aerial spraying of adulticides, which the county typically sprays into the air from trucks.

Labels for Scourge and Anvil, the adulticides the county uses, warn against direct application to surface waters. Spatt said the Baykeeper failed to prove misuse because the chemicals were sprayed into the air and pilots were, for the most part, told to turn off their spray nozzles when flying over streams, rivers and bays.

The decision also said Suffolk was permitted to discharge dredge spoils from upkeep of its 660 miles of mosquito ditches under an exemption in the Clean Water Act concerning drainage ditch maintenance.

Suffolk County Executive Steve Levy said in a written statement that the county was "pleased" by the decision and that Suffolk had followed "all the proper environmental procedures."

Board Meeting Highlights

- Hurricane Relief: The AMCA sent out an e-mail to its members asking for monetary support for Texas mosquito control districts hit hard because of Hurricane Ike. MMCA sent \$150 to the Texas Mosquito Control Association to help mosquito control employees who have suffered losses as a result of Hurricane Ike.
- Michigan Township Association (MTA) Speakers: Mr. Dinsmore provided details about MMCA members (Tom Wilmot and Randy Knepper) registering with the MTA as possible speakers for their various meetings and conferences.
- MEHA: Mr. Knepper was a speaker for National Environmental Health Association and CDC sponsored workshop titled "Biology and Control of Insects & Rodents" which was held at the Four Points Sheraton in Saginaw, MI. October 22-23, 2008.
- Scientific Committee was asked to look at the "Emerging Diseases" section of the MMCA webpage.
- Five essays were received for the 2009 Kenley Farrel Memorial Scholarship topic, "History of Mosquito-borne Disease in Michigan". The winners are: 1st place – Justin Middleton and 2nd place – Megan Morris.
- Account balances as of December 12 were: Chemical Bank Checking (\$3,130.85), National City CDs (\$12,500), and Total Funds (\$15,630.85).
- MMCA's 2010 Conference will be February 3-4, at the Traverse City's Park Place Hotel.
- Mr. Stanuszek thanked Ms. Jenifer Robb for her hard work on updating and fixing the MMCA website on the new server. The website looks very nice and is running smoothly.
- Mr. Stanuszek reported for Mr. Knepper that the PESP annual report was filed online and a hard copy was sent to AMCA's PESP Committee Chairman.



News From Around The Districts

We wrapped up our season on October 3rd with an end to official control operations. Since then we've been busy with the annual report, invoices, correspondence, cleaning, inventories/orders, equipment repairs, and preparations for the 2009 season. The 2008 Annual Report has also been completed and will be presented to the Board of Commissioners as well as to the Mid-Michigan Technical Advisory Committee in March, 2009.

BAY

The 2009 chemical order was compiled and bid specifications were sent out to vendors in early December in conjunction with Midland County Mosquito Control and Tuscola County Mosquito Abatement. Chemical bids will be opened in Midland in January and vendors will be notified. Along those same lines, we've been working on getting aerial bids ready to be sent out for the spring aerial application of Bti to woodlots throughout the county.

We continue our community-outreach efforts, which include presentations at local elementary schools and planned updates and changes to the mosquito control web page. Retention pond mapping and map updates continue to take place.

In late December, we discovered that a Bay County citizen had tested positive for the West Nile virus – a man (over 50 years old) who had given blood in August, which, when screened, was WNV-positive. The case was originally assigned to Kent County (where the blood had been tested), but was later re-assigned to Bay County where the man resides. When interviewed by public health nurses, the man remembered being in his yard washing his vehicle in the evening hours and camping in Isabella County several days before giving blood. The patient is feeling well.

In the next few months we'll be working on MMCA annual meeting presentations, the program plan, and the process of hiring new seasonal staff – always a challenge!

Most of the snow has melted these last days of December and I am thankful it wasn't all melting all at once in March or April leaving large snowmelt pools. However, winter has only just begun!

TUSCOLA

The seasonal staff has left, the last being our office personnel on October 15th. Just our Biologist –Rich and I have each other to keep each other company and collaborate on our winter projects.

We did not find West Nile Virus in Tuscola County for the first time since 2002. However, we are realistic that doesn't mean it wasn't here.

We extended our fence out to accommodate additional vehicles in the future. We received new flooring to replace the very worn covering what I think used to be carpeting on the floor.

Our Control Material Bids are out and we hope to open them about mid-January. Thank you to Midland County Mosquito Control for handling this process.

We hope to see you all in Ann Arbor this February!

In his presidential address Charles talked about the recent economic crisis and the federal bailout of big business. I asked him if I ran Midland County Mosquito Control into the ground could I get one of those million dollar bonuses? He's still laughing, which I take to mean I'd better plan on keeping the program going.

As in so many other areas, 2009 will be a tough year for Midland County financially and we will be challenged to continue our established levels of service within a more limited budget. We will concentrate on doing things more efficiently and hope not to face the need to eliminate programs.

One of our important jobs each year is to review our training program and get ready for the new crop of seasonal employees. Those of you that hire employees to conduct mosquito control should be aware that the Michigan Department of Agriculture will be administering new tests for core certification based on a national training manual. The national manual is available in hard copy (see your local extension of MDA office) and online at <http://www.nasda.org/workersafety/> . A set of power-point training presentations are available online at: <http://www.pested.msu.edu/Resources/slides/CertificationSlides.html> .

As always at this time of year, we can feel the excitement of the upcoming annual conference. We hope to see you all in Ann Arbor February 4 and 5. Best of luck in 2009.

As is typical for this time of year staff are busy on winter projects which include: repair and preventative maintenance of application equipment and vehicles; fabrication of new ULV spray equipment control boxes for truck cabs; body work on damaged vehicles; development of new customized spray route maps; continue investigate updating our automatic vehicle location (AVL) system; and purchase and outfitting three new half ton vehicles for our fleet.

Our 2008 annual report has been completed and can be reviewed or printed from our website at www.scmac.org for those who may be interested. Our website has been recently redone and I would encourage anyone who hasn't visited it in awhile to check it out as it's full of much more information and pictures than our last website.

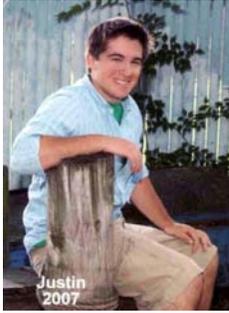
We have already begun the process of securing permits to allow us to conduct aerial larviciding for spring mosquitoes on federal refuge and state game lands. It appears that we have met the criteria this year for the federal refuge but may encounter difficulties with getting permits for the two State game areas we annually larvicide. It is also our plan to work with the Shiawassee NWR staff to update their Human Health Emergency Response Plan. If we can be successful in implementing changes to this plan it would streamline the permitting process and hopefully alleviate the yearly permitting issues we have recently experienced.

In the next couple months we will begin the process of hiring seasonal staff for the upcoming season; revise and update our yearly Program Plan; and send out letters to citizens on our No Spray list and Medical Certification list.

Paul Kinde joined our staff in November following the retirement of our long term foreman Tom Burt. I would encourage everyone to welcome Paul to the mosquito control profession at the upcoming MMCA meeting!

As always, we have the whole winter to get our projects done but it seems this time goes very fast and before long we will be looking at larvae in vernal snowmelt pools!

Kenley Farrel Memorial Scholarship Winners: Sponsored by Hatfield's Spraying Services



1st Place

Justin Middleton
Essexville, Michigan

Justin is a student at the University of Michigan, in the Honors Program, pursuing a degree in biophysics. He has done undergraduate research in astrophysics, and is currently doing research on prostate cancer. He plans on a career in cancer or neurodegenerative disease research. Justin is a seasonal technician at Bay County Mosquito Control.



Runner Up

Megan Morris
Saginaw, Michigan

Megan is attending Saginaw Valley State University, pursuing a career in health sciences, nursing. She has worked for three summers in the Biology lab. at Saginaw County Mosquito Abatement Commission. She enjoys reading, camping, running, and spending time with her family and friends.



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Winter