



LAKE TIDES

The newsletter for people interested in Wisconsin lakes

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Little Fly

West Nile Virus...A Concern for Lake Users?

Those of us that like watery places have learned to love or live with most of the denizens that reside there, but one drives us buggy...the mosquito. We understand the idea of a food chain and the need for all creatures to exist to keep an ecosystem in balance; we have even found some level of détente with those pesky mosquitoes. Sometimes they force you inside on a summer evening and at their worst, a lone intruder will find your ear and drive you crazy in the middle of the night. Mosquitoes have always been annoying but we know that they are an important part of the water environment. Now we are hearing that there is a danger carried by mosquitoes, more than just an itch...West Nile Virus.

The word, mosquito, is Spanish for little fly. Mosquitoes are insects belonging to the order Diptera, the True Flies. Like all True Flies, mosquitoes have wings, but unlike flies mosquito wings have scales. There are over 2500 different species of mosquitoes in the world but only around 50 species of mosquitoes make their home in Wisconsin. A mosquito's principal food is nectar or a similar sugar source. Only female mosquitoes bite, they require a blood meal to breed. For 30 million years they have been sharpening (pardon the pun) their skills at finding a blood meal. Just about all mammals and birds give off carbon dioxide and lactic acid. Mosquitoes can detect these gases from as far as 100 feet away. If you are wearing clothes that contrast with your background and you are moving, mosquitoes can more effectively zero in on your person. Mosquitoes can also detect heat, sweat and body odors. Some species of mosquitoes can fly 15-30 miles from their breeding sites in search of a meal.

History

West Nile (WN) virus has emerged in recent years in temperate regions of Europe and North America, presenting a threat to human and animal health. The most serious

manifestation of WN virus infection is fatal encephalitis (inflammation of the brain) in humans and horses, as well as mortality in certain domestic and wild birds.

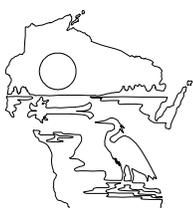
West Nile virus was first isolated in the West Nile District of Uganda in 1937. The virus became recognized as a cause of severe human meningoencephalitis (inflammation of the spinal cord and brain) in elderly patients during an outbreak in Israel in 1957. It has been reported in most parts of the world, but first appeared in North America in 1999. Since then, the disease has been spreading rapidly across the U.S. At this time it has been reported in all but four western states. Wisconsin health officials reported activity in sixty-five of Wisconsin's seventy-two counties in 2002.



Raptors such as this osprey can be carriers of the West Nile virus.

How does it spread?

Mosquitoes become infected when they feed on infected birds, which may circulate the virus in their blood for several days. Infected mosquitoes can then transmit West Nile virus to humans and animals while biting to take blood. The virus is located in the mosquito's salivary glands. During blood feeding, the virus may be injected into the



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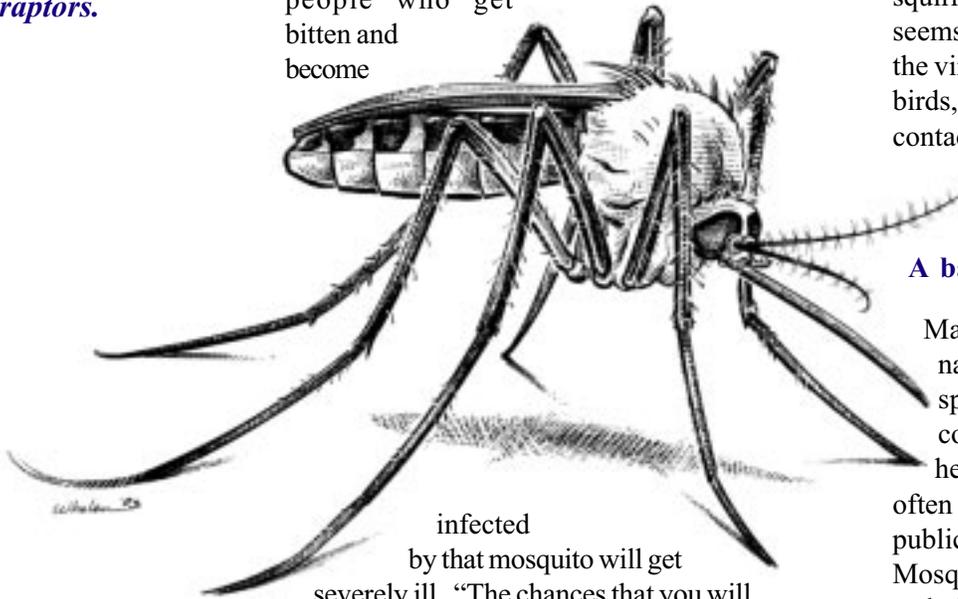
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animal or human, where it may multiply and possibly cause illness.

Risks and Symptoms

All residents of areas where virus activity has been identified are at risk of contracting West Nile encephalitis; persons over 50 years of age have the highest risk of severe disease. At this time it is unknown if immunocompromised persons are at increased risk for WN virus disease. According to the Center for Disease Control (CDC), even in areas where the virus is circulating, very few mosquitoes are infected with the virus. Even if a mosquito is infected, less than 1% of people who get bitten and become

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infected by that mosquito will get severely ill. "The chances that you will become severely ill from any one mosquito bite are extremely small," says Dr. Mohammad Almoujahed at the Medical College of Wisconsin, Milwaukee

Most WN virus-infected humans show no symptoms. A few develop mild symptoms such as body aches, rash, fever, and swollen lymph nodes. Less than one percent of people develop more severe illness. These symptoms can include headaches, high fever, neck stiffness, disorientation, coma and tremors. There is no specific treatment for WN virus, nor does a vaccine exist to prevent it.

There is no scientific evidence indicating that people can be chronically infected with West

Nile virus. What remain in a person's body for long periods of time are antibodies and "memory" white blood cells (T-lymphocytes) that the body produces to fight the virus. Antibodies are what many diagnostic tests look for when clinical laboratory testing is performed. Both antibodies and "memory" T-lymphocytes provide future protection from the virus. It is assumed that immunity will be life-long; however, it may wane in later years.

The vast majority of animal infections have been identified in birds. In fact, West Nile virus may be one of the most significant factors now causing mortality to many species of wild birds, including raptors. As a wildlife disease, it may be having devastating effects. The virus has also been shown to infect horses, cats, bats, chipmunks, skunks, squirrels, and domestic rabbits. While there seems to be no evidence that a person can get the virus from handling live or dead infected birds, people should avoid bare-handed contact when handling *any* dead animals and use gloves or double plastic bags to handle the carcass.

A balancing act...mosquito control

Many federal and state agencies across the nation have geared up to monitor the spread of WN virus. The questions that come with mosquito control and public health needs are difficult ones. What is often required is a balancing act between public health and ecosystem health. Mosquitoes can be killed with a number of techniques: larvicides, Malathion, Naled, and Synthetic Pyrethroids. A new tool, *Bacillus thuringiensis* variety *israelensis* (BTI), takes the form of a microbial pathogen. It kills the larvae of mosquitoes, black flies, and midges. A team of researchers at UW-Madison is also working to genetically manipulate mosquitoes so that they will not carry diseases.

We understand that everything in nature is a part of a whole. If you open up a trout's belly you may find it filled with mosquito larva. Mosquitoes, like many insects in all stages of life (egg, larva, pupa and adult), provide a very important food source for fish, turtles, frogs, birds, dragonflies and bats. Mosquitoes also pollinate flowers. Often the impact of pesticides and larvicides (like those listed



Most water lovers know that preventing every mosquito bite outside and near water may be next to impossible. Reducing the bites instead of the bugs may be the single most effective way to reduce the risk of WN. Many outdoor people have a war chest filled with ways to keep mosquitoes at bay...let's review a few.

Insect repellents help people reduce their exposure to mosquito bites. DEET is the most effective and best-studied insect repellent available. DEET (N,N-diethyl-m-toluamide) is an ingredient used to repel pests like mosquitoes and ticks. The more DEET a repellent contains, the longer it lasts to protect against mosquito bites. A higher percentage of DEET in a repellent does not mean that protection is better—just that it will last longer. DEET concentrations higher than 50% do not increase the length of protection. Be sure to read and follow the directions and precautions, especially when applying DEET to children.

- Wear protective clothing, including long pants and long sleeved shirts.
- Bug jackets made from netting can be effective (bug jackets are often used by paddlers and hikers where bugs can be extreme.)
- Stay away from mosquito-laden areas at dusk.
- Limit standing in stagnant water found in rain gutters, old tires, water gardens, rain barrels, or other containers.
- Change water often in wading pools and bird baths.
- Aerate or keep fish in ponds.
- Repair screens.
- Replace outdoor lights with yellow bug lights.

Note: Bug zappers do not attract mosquitoes!

above) on humans is not that well understood. No pesticide can be considered 100% safe. Pesticides often do not discriminate and when used for mosquito control, can kill most insects including honeybees, butterflies and other insects that pollinate flowers, plus many other organisms, including fish.

Being near the water is important to us and questions relating to control of mosquitoes and other pests are challenging. Trying to eliminate the mosquito from our world using today's mosquito control tools may do more harm than good. Most folks realize that any attempts to eliminate mosquitoes would be inadequate in a rural environment. However, simple but effective yard awareness (removing old tires, etc.) may tip the scales. Clearly, life on the lake is often a balancing act. We must weigh today's legitimate human health concerns relating to West Nile virus with concerns for maintaining a healthy environment. Ultimately, we must keep in mind that human health is dependent on a healthy environment.

Where can I get more information?

For more information on mosquito control, see our web site at www.uwsp.edu/cnr/uwexlakes. In your area, contact your state or local health department. Other resources for information on public health, disease control, and mosquito control include the following:

Wisconsin Department of Health and Family Services: http://www.dhfs.state.wi.us/dph_bcd/westnilevirus

Centers for Disease Control and Prevention (CDC): <http://www.cdc.gov/ncidod/westnile/qa/overview.htm>
Tel: 970-221-6400
Fax: 970-221-6476
E-mail: dvbid@cdc.gov

West Nile Virus Resource Guide: <http://npic.orst.edu/wnv/>

American Mosquito Control Association (AMCA):
<http://www.mosquito.org/>
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