PURDUE UNIVERSITY

Purdue Extension Water Quality Program

Healthy Ponds and Wetlands: They Don't Spread West Nile Virus

Mosquitoes breed in standing water, and people wonder about the role of ponds and wetlands in relation to mosquito populations.

About Ponds and Wetlands

Although poorly managed ponds and wetlands may increase mosquito populations, predators of mosquitoes such as fish and other aquatic organisms will usually control mosquito populations if the pond or wetland supports a well-balanced ecosystem.

Three key factors in ponds that naturally destroy mosquito larvae are fish, aquatic insect predators, and surface wave action. Maintaining a high-quality natural plant buffer around the pond will provide habitat for beneficial predators. Top-feeding minnows and other native fish in the pond will reduce or eliminate mosquito larvae. If the pond is stagnant, using mechanical aeration will increase water movement and provide the oxygen that fish need to live. Keeping grass clippings and other debris out of the pond protects water quality.

Natural wetlands and wetland restoration can decrease mosquito populations by providing habitat for natural enemies of mosquitoes and by reducing or preventing flooding in non-wetland areas. Such flooding tends to produce mosquitoes.

There are many reasons we need ponds and wetlands in the landscape. These benefits in most cases outweigh mosquito concerns, as long as the pond or wetland is well-managed.

- Ponds created to manage storm water in new developments reduce storm water runoff problems by catching and slowing the movement of storm water.
- Ponds beautify the landscape and provide recreational outlets for many Hoosiers, including fishing, swimming, boating, and hunting.
- Ponds and wetlands provide habitat for a diversity of species, including birds, bats, aquatic insects, fish, and amphibians, all of which feed on mosquitoes.
- Ponds and wetlands help filter and clean rainfall and runoff water, and help recharge ground water aquifers.

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About Mosquitoes

One type of problem mosquito is the so-called "house mosquito complex" (*Culex* mosquitoes) which includes species known to transmit West Nile virus. Females lay egg "rafts" on standing water in the summer, and the eggs hatch and develop into adult mosquitoes two or three weeks later. So if you regularly empty containers that hold standing water, you can disrupt the breeding cycle.

Common larval developmental sites include discarded tires, barrels, buckets, flowerpots, pet dishes, rain gutters, birdbaths, wheel ruts, etc. Homeowners should eliminate or at least regularly empty these containers to reduce the number of larvae that develop into biting adults. Bites of *Culex* mosquitoes are relatively painless and tend to go unnoticed. Surveys in Tippecanoe County, Indiana, in 2003 revealed few or no populations of the West Nile-transmitting mosquitoes in natural habitats or in retention ponds, whereas much higher populations were found in artificial habitats and areas where contaminated runoff pooled.

A second type of problem mosquito is the so-called "rain water" or "flood water" mosquitoes (certain *Aedes*, *Ochlerotatus*, and *Psorophora* mosquitoes), none of which is known to be transmitters of West Nile virus. Females lay single eggs on moist soil in sites where standing water has existed and that are subject to inundation by future rain or flooding. These larval developmental sites often are extensive, difficult to eliminate, infeasible to treat with insecticides, and produce large numbers of biting adults. Bites of these mosquitoes are relatively painful and certainly are noticed.

For More Information

More information and tips for owners of ponds, wetlands, and homes is provided in the Purdue Extension publication: *Management of Ponds, Wetlands, and Other Water Reservoirs to Minimize Mosquitoes*, WQ-41-W www.ecn.purdue.edu/SafeWater/Ponds/WQ-41-W.pdf. This publication can be found on the Purdue Extension Water Quality Web site at www.ces.purdue.edu/waterquality, and then clicking on the "Ponds" button.

See next page for sources of more information

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Additional Contacts and Information

Mosquitoes and Water Quality

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Wetlands

• Indiana Department of Natural Resources: *Indiana Wetlands Conservation Initiative Fact Sheet: Did You Know? Healthy Wetlands Devour Mosquitoes* www.in.gov/dnr/fishwild/publications/inwetcon/hlywet.pdf

• Natural Resources Conservation Service: *Indiana Biology Technical Note 4: Wetlands, Mosquitoes, and West Nile Virus* www.in.nrcs.usda.gov/intranet/TechnicalNotes/Indiana_Tech_note_4.pdf

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