

# Construct a Healthy Wetland — Destroy Mosquitoes

By Emily Biebighauser, May 2006

## Handling the Truth

Would you like to enjoy the many aesthetic and environmental benefits of constructing a wetland on your property — but are worried about West Nile Virus? Then read on, learn the real risks, and find out why healthy wetlands actually lower mosquito populations.

## The Real Culprit

Of the many species of mosquitoes, it's usually the *Culex* mosquito that carries the West Nile Virus. *Culex* is commonly termed the 'filth mosquito', as it favors small bodies of water with high organic content for breeding and survival of its larvae. This means that gutters clogged with leaves, puddles on top of woodpile tarps, wastewater outflows, unkempt swimming pools, and birdbaths are prime habitat for the next generation of filth mosquito.<sup>1</sup>



Tired of swatting mosquitoes in general? Nearly all mosquitoes will breed in any small pool of water created after a hard rain, and because of their short life cycles (from under a week to a month), this makes junked tires, toys left out in the yard, and road ruts their ideal nursery. In fact, one Indiana county found that 66% of West Nile carrying mosquitoes originated from abandoned tires (example in photo above).<sup>2</sup>

## Natural Enemies

So why do mosquitoes prefer these short-lived puddles? Because they are highly variable habitats, drying up and wetting again, which prevents their natural, longer-lived predators from becoming established. Larval mosquitoes have many aquatic enemies, including:

- Dragonfly nymphs (below is the Calico Pennant dragonfly, photo by Richard Bledsoe).
- Salamander larvae.
- Water boatman.
- Backswimmers.
- Water striders.
- Damselfly larvae.
- Fish.
- Ducks.



The above list of species are common in most healthy wetlands and proven to keep mosquito populations in check.<sup>3, 4, 5</sup> Not even adult mosquitoes are safe near a functioning wetland, as it attracts bats, swallows, and amphibians, all of which will feed on mosquitoes.<sup>3</sup>

## The Two D's: Drainage and Degradation

But haven't you always heard that wetlands are the biggest source of mosquitoes? True, some wetlands can harbor substantial mosquito populations, but these aren't healthy ecosystems. In fact, they are often critically damaged in two ways: by drainage and degradation.

Drained wetlands may leave hydric depressions in the landscape, meaning that when a heavy rainfall event occurs, a few inches of standing water will pool in the depression. This allows mosquitoes to breed and lay eggs, and even if the pool dries up before the eggs can hatch, they may remain dormant for up to a year, hatching soon after the next rain.

Wetlands degraded from polluted surface runoff (everything from cow manure to the oily runoff from a parking lot) aren't capable of supporting the mosquitoes' less pollution-tolerant predators. When you consider that well over half of America's natural wetlands have been drained or degraded in some way, it's no wonder people believe they are a source of nuisance and disease.<sup>3, 6</sup>

## Healthy Wetlands in the Real World

In Essex County, Massachusetts, the restoration of a 1,500 acre wetland cut the mosquito population by 90%.<sup>1</sup> Wildlife Biologist Tom Biebighauser has sampled hundreds of natural and constructed wetlands on the Daniel Boone National Forest. He has found few to none contain mosquito larvae, and nearly all contain mosquito predators. An important fact, he states, is that the watersheds of these wetlands are typically vegetated with grasses and trees, with no erosion or pesticide runoff.<sup>7</sup> In other words, they're healthy (example in photo above).



## The Next Step

Help out wildlife while keeping mosquito populations down and construct a healthy wetland or restore one that has been degraded. Here are a few basic steps to get you started:

- Clean up a watershed (control erosion, reduce fertilizer and pesticide runoff).
- Install bat houses, tree swallow nest boxes, martin houses.
- Allow for plenty of vegetation surrounding the wetland (for dragonflies and damselflies).
- Prevent livestock access.
- If the area around the wetland is mown, fill in any ruts left behind.

## RESOURCES

1. Did You Know?...Healthy Wetlands Devour Mosquitoes. <http://www.fnr.purdue.edu/inwood/past%20issues/mosquito.htm>
2. Take a bite out of the West Nile Virus: Restore a Wetland. Hoosier Wetlands 1(9). <http://www.in.gov/wetlands/>
3. West Nile Virus and Wetlands: Wetland predators lower mosquito populations, WNV risk. Wisconsin Department of Natural Resources.
4. Fish stocking for mosquito control. Illinois Department of Natural Resources. <http://dnr.state.il.us/fish/FishStockingForMosquitoControl.htm>
5. Frequently asked questions: Waterfowl facts. <http://www.ducks.ca/resource/general/faq/faq2.html>
6. Wetlands: Status and trends. <http://www.epa.gov/OWOW/wetlands/vital/status.html>
7. Biebighauser, Thomas. Personal communication. 2006. Wildlife Biologist, USDA Forest Service.