

West Nile's 'super spreader'—the American robin?

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The 2012 outbreak of West Nile virus, according to the U.S. Centers for Disease Control and Prevention, promises to be the largest since the disease was first detected in the United States 13 years ago.

Since arriving in 1999 from Europe or Africa, the disease has spread to nearly every state and a growing body of evidence is pointing to the iconic American robin as the primary culprit for [spreading the disease](#) in the Northeastern and Midwestern U.S.

"Robins are in the sweet spot," explains Tony Goldberg, a University of Wisconsin-Madison infectious disease expert who has been running a National Science Foundation-supported study of West Nile transmission in the suburbs of Chicago for nearly a decade. "They are abundant, mosquitoes like to feed on them, and they happen to support [virus infection](#) better than other species."

Since 1999, the virus has since infected more than 30,000 people, mostly through the bites of infected mosquitoes. An opportunist, the virus infects a wide variety of host animals: dogs, cats, bats, horses, chipmunks, squirrels, rabbits and even crocodiles can acquire it. These animals are "dead-end hosts" and can't transmit the virus, Goldberg notes, because West Nile virus only multiplies to high levels in birds.

Birds are far and away the most frequent carriers, and the ubiquitous robin, a mainstay of suburban American lawns, cemeteries and golf courses, has now been identified in several studies, including one by

Goldberg's group, as the West Nile "super spreader."

In suburban Chicago, century-old backyard catch basins and gutters provide ideal habitat for West Nile's primary insect vector, the *Culex pipiens* mosquito, also known as the northern house mosquito, which breeds in small standing pools or containers of water laced with organic matter. This year, the [Culex mosquito](#) is thriving because its breeding habits seem to be little affected by the drought.

"If it is hot and dry, standing water has a chance to ferment so *Culex* mosquitoes have plenty of places to breed. We think this may be a very good year for West Nile transmission," says Goldberg, a professor of pathobiological sciences at the UW-Madison School of Veterinary Medicine. Statistics from the U.S. Centers for Disease Control bear this out, showing more than 1,100 cases and 41 deaths attributed to West Nile through mid-August, the most serious outbreak since the disease made its U.S. debut in 1999.

Goldberg and his colleagues have been prowling Chicago's western suburbs, a hot spot for the disease, in an effort to accurately profile all the players and dynamics involved in its spread. The work involves trapping feeding mosquitoes and checking their blood meals to see what animals they've been feasting on. Isotopic analyses are also used to trace the mosquitoes to their exact breeding location, sometimes the very catch basins in which they hatched.

In recent years, Goldberg's group has turned its attention to West Nile's bird hosts, and robins in particular. With the aid of tiny, temporary featherweight transmitters, the Wisconsin researchers prowl the suburban landscape, often at night, following the avian players in the West Nile drama. A key finding by Goldberg's group is that the birds roost at night communally, in groups ranging from tens to thousands of individuals.

"We've tracked them to their nighttime roosts, which are very impressive," says Goldberg. "You can walk in at night, shine a flashlight, and they're like apples on the trees."

The roosts seem to be ideal feeding grounds for *Culex* mosquitoes, which feed mostly at dawn and dusk. In work led by former UW-Madison post-doctoral researcher Gabriel L. Hamer, now of Texas A&M University, the feeding strategies of *Culex* mosquitoes and the spread of West Nile were tied directly to American robin abundance.

"At least two groups, including ours, have concluded that robins account for a very high proportion of [West Nile virus](#) positive mosquitoes flying around at any given time," says Goldberg. "They are super spreaders, more important to the spread of West Nile in the Northeast and Midwest than any other host."

Provided by University of Wisconsin-Madison

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