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Mowing dry detention basins makes mosquito problems worse, team finds

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Some dry detention basins do not drain properly, and so promote the growth of wetland plants. Credit: Andrew Mackay

A study of the West Nile virus risk associated with "dry" water-detention basins in Central Illinois took an unexpected turn when land managers started mowing the basins. The mowing of wetland plants in basins that failed to drain properly led to a boom in populations of *Culex pipiens* mosquitoes, which can carry and transmit the deadly virus, researchers report.

A paper describing their findings is in press in the journal *Ecological Applications*.

The team, led by University of Illinois postdoctoral researcher Andrew Mackay, found that mowing down cattails and phragmites, two invasive plants that tend to permeate stormwater basins, adds a lot of plant debris to the water.

"We suspect bacteria quickly colonize the waterborne debris, and mosquito larvae feed on the bacteria," said Illinois entomology professor Brian Allan, a co-author on the study with Mackay, Illinois Natural History Survey entomologist Ephantus Muturi and U. of I. natural resources and environmental sciences professor Michael Ward.

"After aquatic plants were mowed in the basins, we saw a large increase in the number of *Culex pipiens* mosquito larvae in the basins, which had relatively few before mowing," Mackay said. "And perhaps more importantly, we caught about twice as many adult *Culex* mosquitoes in traps at basins after these plants were mowed, compared with basins where the aquatic vegetation was left intact."

Mowing phragmites, a tall and sturdy invasive grass, also dispersed a host of bird species that liked to roost in the grass, Allan said.

"We had observed that these phragmites-invaded basins would become colonized by large communal roosts of birds," he said. "And we thought

that was important because birds are the natural reservoir hosts of West Nile Virus."

The researchers suspected that a bird roost near a mosquito nursery might increase the West Nile virus risk to people living nearby.

Rather than decreasing risk, mowing wetland plants in dry detention basins can exacerbate a mosquito problem, researchers found. Credit: Andrew Mackay

"Instead, we found that the presence of a communal bird roost actually decreased West Nile virus risk," Allan said. "That may be because these

wetland roosts include a variety of bird species, many of which are not good reservoirs of the virus. They don't amplify the virus like other bird species more associated with residential areas do - the American robin, for example.

"We measured mosquito abundance, and we measured West Nile virus prevalence in the mosquitoes we collected in this field study, and we were able to show that it's these mowed areas where you actually get the highest West Nile virus risk to people in the surrounding landscape," Allan said.

"You might think you're helping by mowing, but you're creating another problem," Muturi said. "It's all a matter of good planning and coordination to be sure that the kind of activities we do, either for aesthetic or for any other reason, don't increase public health risk."

Provided by University of Illinois at Urbana-Champaign

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