

Fish and Wildlife's Green Approach to Mosquito Control

By Kathy Canavan

Saltmarsh mosquitoes changed life around Dover in the summer of 1956. As swarms of female mosquitoes headed inland for blood meals, homemakers stopped hanging their wash out on Mondays. Air Force cargo planes were delayed. Ball games were cancelled. Families routinely wiped their dogs down with towels before they let them inside on summer nights. In one swipe, the towels were covered with blood and bugs. Mothers and their mosquito-bitten children marched on the state legislature demanding insect control. Doctors feared a mosquito-borne virus called Eastern Equine Encephalitis that could be fatal to humans and horses. People joked about naming the lowly mosquito Delaware's state bird.

Fast forward about 45 years: Life in Delaware is relatively mosquito-free. When several dead crows tested positive for West Nile Virus in New Castle County last summer and some horses contracted the disease downstate, most Delawareans were not overly alarmed.

The big difference: Last summer, the Division of Fish & Wildlife's mosquito control biologists were again working hard in the salt marshes and other wetlands to curb mosquito breeding. Staff inspectors were holding out their arms all over the state to calculate the mosquito-landing rate in neighborhoods, and scientists were checking traps in cities and towns to keep tabs on the mosquito's spread. When necessary, areas were sprayed to knock down skeeters on-wing.

Say "mosquito control" and most Americans conjure up visions of crop dusters and chemical trucks, but our state's controls are different. There are more than 900 mosquito-control programs in the U.S., but Delaware's is one of a handful housed within a state fish-and-wildlife agency.

Bill Meredith, the Ph.D. biologist who heads the state's Mosquito Control Section, can rattle off which mosquito species might fly only one or two miles from their breeding spots and which can routinely fly 10 to 15 miles. While Meredith can tell you where and when each species breeds, his office is curiously devoid of pinned insects or even Far Side insect cartoons. It is filled with gently colored nature prints and shorebird sculptures instead.

Surrounded by colleague Division of Fish & Wildlife experts, Meredith says he is constantly aware of the unintended effects insecticides can potentially have on the food chain. He says his technical staff members are biologists first, bug killers second. Meredith considers spraying insecticides a last resort, especially spraying adulticides to

kill adult mosquitoes in populated areas. However, when altering breeding habitats or spraying larvicides to kill immature stages can't control mosquitoes, then adulticides must be used. All insecticides used are EPA-registered and can be applied without unacceptable risk to humans, wildlife or the environment. Spraying is done by hand, truck, helicopter or airplane as warranted by surveillance.

"When a mosquito control program is housed in a fish-and-wildlife agency, we're in a culture where concerns for issues like lessening non-target impacts or promoting biodiversity have high priority," Meredith says. "We touch a lot of other programs in doing our necessary work. There's the possibility of doing very good things here, or if we do it wrong, some very bad things."

Within DNREC, mosquito control scientists deal daily with wildlife populations, fisheries habitats, marsh restoration, impoundment management, natural heritage and biodiversity, wetlands permits, water quality, Superfund projects, coastal zone issues, scrap tire problems, even archaeological findings. Meredith says being housed in DNREC is a natural fit for them, and it helps a host of other DNREC programs as well. Mosquito control biologists also work outward from their natural base in DNREC, collaborating with federal wildlife managers at Bombay Hook and Prime Hook National Wildlife Refuges, other U.S. Fish and Wildlife Service personnel making wetland improvements on private lands, the state veterinarian regarding equine diseases, the Division of Public Health's virology lab and epidemiology programs, the Department of Agriculture's pesticide regulatory program, the Army Corps of Engineers dredge disposal program, and even the state apiarist concerning potential impacts to commercial beekeeping.

"We have a very green approach to mosquito control," Meredith says. "We are the envy of many other mosquito control programs around the country because of where we are housed." The long national history of poor relations between mosquito control programs and natural resource management has pretty much faded in Delaware, largely because of mosquito control's placement.

While mosquito control programs in other states are often located in agencies where environment protection is not the primary mission, Delaware's mosquito control biologists know what they do can have a domino effect on wetland wildlife. One example: The Civilian Conservation Corps of the 1930s dug parallel-grid ditches across most of Delaware's tidal wetlands to control mosquitoes, and much of the extensive system was dredged mechanically in the mid 1960s. It wasn't until more recently that scientists found mosquitoes breed in only about 10 percent of the wetlands, and the CCC's work unnecessarily drained many wetlands without controlling all mosquito production. The dewatered wetlands lost many large ponds that were valuable nurseries for estuarine fish and invertebrates, and good habitats for waterfowl, wading birds and shorebirds.

Today Section biologists wade into the wetlands, look for isolated, desktop-sized depressions where saltmarsh mosquitoes typically breed, and stake them. When they find a large group of breeding potholes, they use heavy equipment to dig a shallow pond that

encompasses them, with spur ditches radiating to isolated depressions. The ponds contain resident killifishes that eat mosquito larvae, and also support water birds, aquatic plants and fish. The Section also uses its equipment and expertise to manage marsh water levels and tidal exchanges over thousands of acres of Delaware's coastal impoundments.

Visitors from the 1950s wouldn't recognize Delaware's coast or countryside nowadays with burgeoning development. With more people living closer to coastal marshes or wet woodlands, Meredith's staff gets more frequent complains about mosquitoes, especially since the recent arrival of West Nile Virus in Delaware. Meredith says his Section is spraying insecticides less than it did a generation ago, with scientists now handling more complaints by spraying localized trouble spots instead of vast acreage.

"There is a strong public mandate in Delaware to control mosquitoes because of their adverse impacts to quality of life, public health and local economies, but we must do this in the most environmentally sound manner possible," Meredith states. When mosquito control biologists work in tandem with other Fish & Wildlife staff and professionals from other agencies, the wetlands can teem with life instead of being drained dry. "Before the late 1960s, the feeling of many people and government agencies was that marshes or swamps weren't worth anything. They were just wastelands back then," Meredith says, chuckling. "Now they're valuable wetlands, and rightly so."