



United States Army Corps of Engineers
Wilmington District
P.O. Box 1890
Wilmington, North Carolina 28402-1890

News Release

Contact: PUBLIC AFFAIRS OFFICE
Phone: (910) 251-4626

Intergovernmental partnership wins battle against mosquitoes

By Penelope Schmitt
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WILMINGTON, North Carolina—Before 1995, Eagle Island, a 930-acre Corps of Engineers dredge disposal site along the Cape Fear River, was an infamous mosquito breeding ground. It was such a fearsome place, Ken Sholar recalls, that a local reporter touring the site took one look through her car's windshield and refused to go out into the firestorm of swarming insects. Sholar, New Hanover County's Mosquito Control Officer, is proud to report that times and conditions have changed. "We all had a piece of the puzzle, but until we put it together, we weren't getting anywhere," he said.

The "We" Sholar named are New Hanover County, Brunswick County, and the U.S. Army Corps of Engineers. Rick Hickman, Mosquito Control Officer for Brunswick County, agreed with Sholar. "We were told by experts from Florida that 50 percent control of an area like Eagle Island was the best we could expect. Now we have control of 800 acres on Eagle Island."

The intergovernmental group's success results from information and resource sharing among the three agencies, each of which is responsible for work on Eagle Island. The Corps has supplied contracts and the money to support them, as well as some mechanical assistance. The counties have supplied the Vector Control expertise and executed the program. Since 1995, the group have successfully implemented an Integrated Pest Management program that has driven mosquito populations down so that they don't reach what's called "migratory brood" levels.

"Some species we have here in North Carolina, especially *Aedes sollicitans*, can be carriers for Triple-E virus (Eastern Equine Encephalitis), a potentially dangerous disease," Hickman explained. "When the mosquito population gets dense enough, the females instinctively migrate to find new territory," Sholar added. "That could lead the mosquitoes to break out of Eagle Island, and we'd be spraying pesticides up and down the streets of the city of Wilmington and in Brunswick County communities."

"That's why we fight the battle on Eagle Island," Hickman said, "so we can avoid large populations of mosquitoes getting to where people live."

Partnership between the two counties and the Corps of Engineers has been critical in winning the mosquito war. The three weapons are surveillance, information and resource sharing, and timing of effort. "It's a dynamic program," said Jeff Brown, a Medical Entomologist with the North Carolina Department of Environment and Natural Resources. "When these guys hit a seasonal peak of mosquito population, they have four to five days to treat Eagle Island, Brunswick and New Hanover Counties, and the Intracoastal Waterway. It's critical that their information be accurate for them to get the job done in such a narrow window."

"We've put our heads together with Howard Varnam, the Corps' project manager for Eagle Island. By mapping populations and carefully tracking Corps work, we can treat 130 acres instead of 800 acres, use more environmentally friendly methods, and kill more mosquitoes."

Surveillance techniques range from the primitive—how many mosquitoes land on your body in two minutes? —To counting the number and kinds of mosquitoes caught in light traps, monitoring rain gauges, and dipping water samples to see if they contain a few larvae or are "mosquito soup." All this data is compiled on a computerized database and tracked weekly. It enables the Mosquito Control team to respond at the right stage of the life cycle to suppress populations before they explode into migratory brood status.

Control methods are not only carefully timed, they are carefully chosen and targeted to maximize suppression of the insects, while minimizing damage to the environment. "In the period up to 1995, before these three entities got together," said Jeff Brown, "the whole process was reactive. There was much more widespread spraying with insecticides. Now, the group has put together a truly proactive Integrated Pest Management program, that uses mechanical and biological means of controlling populations, and turns to chemicals only at critical moments."

The array of biological control methods includes three major weapons. Bti, a bacterium, destroys the stomach lining of mosquito larvae and kills them; Methoprene, a second biological, prevents the larvae from maturing into the adult, egg-laying stage, by overloading their systems with hormones that keep them in a juvenile stage. Finally, flooded areas can be stocked with mosquito fish, minnow-sized swimmers that feed on larvae and suppress populations by simply gobbling them up. "We like the mosquito fish and dragonflies best," Hickman said. "But you've got to understand that Eagle Island is a constantly shifting environment. We can't keep areas flooded all the time."

That's where the U.S. Army Corps of Engineers comes in—as a major player in underwriting the Integrated Pest Management program, and as a direct agent in the mechanical control of populations.

First, the Corps makes a vital difference to the local governments' abilities to put fire on the targeted mosquito breeding grounds. "We don't have expert vector control people working for us in the Wilmington District," said Howard Varnam. "But we do have a great contracting office. We have written, solicited, and paid for contracts that provide New Hanover and Brunswick counties with the labor, equipment and materials to do the job. They have the expert Vector Control people. They execute the contracts." Varnam noted that two other nearby counties, Onslow and Pender, also have Corps-funded contracts for vector control on Corps-managed waterways.

Besides making a major contribution to funding and contracting, the Corps has played a vital part in improving program effectiveness simply by coordinating their work schedule with the mosquito control officers. "Now, we know where the Corps is going, and what they will be doing," Sholar explained. "Mosquitoes are easy to control when land is flooded, and they're easy to control when it's dried out. Whenever land-disturbing activities are going on and the land is transitioning from wet to dry or back again—that's when mosquito populations can explode. Since the Corps keeps us up to date on the times and places for work, we can better monitor and control the situation."

"The Corps didn't know that what they did and when and where they did it could make a difference," Hickman said. "They thought every square inch of salt marsh was prime breeding ground. Now they know that we can target vulnerable areas they create, they keep us informed, and even time their work so that it actually helps us to control mosquitoes better." Best of all, the Corps actually stamps out a major brood. By pumping dredged material onto known breeding sites

in August, the Corps accomplishes its mission, and also virtually wipes out the fall brood of the potential disease carrier, *Ae. Sollicitans*.

"I have nothing but respect for the help the Corps has given us," Ken Sholar said. "As a result of our cooperative effort, we are able to keep the situation on Eagle Island well under control. I know I have more time to work with the rest of New Hanover County than ever before."

What about this year on Eagle Island? The three agencies will use every resource in their impressive arsenals—from mosquito fish to contracts—to ensure another safe year. "They call it 'breaking the back of the hatch,'" Jeff Brown said. "The game is, you track each brood through the surveillance system. You adjust to the Corps' work schedule on the island, and coordinate with them to respond to potential changes and trouble spots. Then you can anticipate what kind of populations to control, at what stage, and hit hard."

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