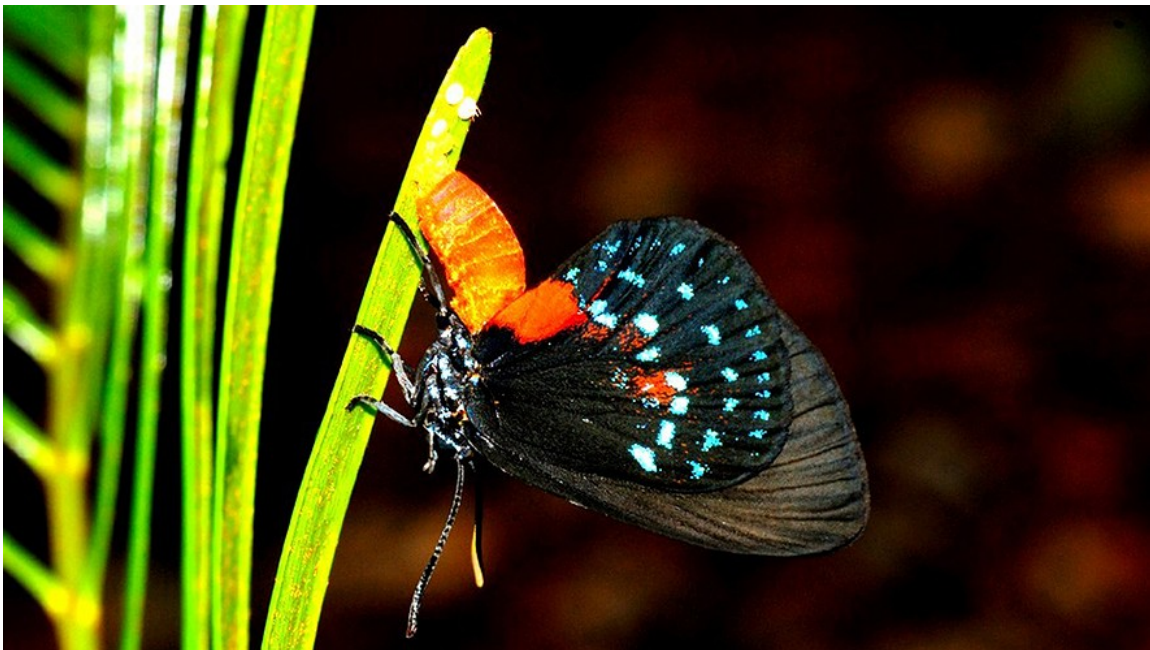


Rare butterflies' habitats designated "no spray" zones in South Florida

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The Florida atala butterfly, pictured here laying eggs on a Florida coontie, was 1 of 5 types of butterflies that FIU scientist Gary Rand used in research that found routine spraying for mosquitoes is more damaging to butterflies than previously thought. Photo: Brian K. Mealey/TNS

Every summer, South Florida residents battle swarms of mosquitoes. They do this by spraying pesticides. However, new research has found that routine spraying is causing much greater harm to innocent bystanders: butterflies.

The U.S. Fish and Wildlife Service commissioned a study to address the growing number of butterflies going extinct. Florida International University researcher Gary Rand found two common chemicals used in spraying - at amounts typically used to control mosquitoes - were toxic to butterflies. While researchers have long suspected that pesticides killed butterflies, Rand's research confirmed this and documented the deadly amounts. He also found that spraying may have lasting effects.

Rand and his research team spent five years studying the impact of the pesticides on butterflies. The findings resulted in federal wildlife managers deciding to increase the boundaries around endangered butterflies' habitats. This forced two counties in Florida — Miami-Dade and Monroe — to change where they spray for mosquitoes.

“It’s up to us to protect them. They don’t protect themselves,” said Rand, who published his findings in three journals this spring.

More Toxicity Tests Needed

Rand is a toxicologist. He believes his research shows the need to broaden insect safety testing for pesticides, which currently is done only on honeybees. Pesticides have come under more and more scrutiny after the widespread collapse of the honeybee populations. However, other pollinators have suffered historic declines too, such as monarch butterflies, wasps and beetles. Since 1990, the number of monarch butterflies has dropped by 970 million, federal officials announced earlier this year.

“You can’t make a blanket statement about insect testing when you only test for honeybees,” Rand said.

Butterflies Get More Breathing Room

Miami-Dade County officials agreed to increase the boundaries for spraying around three areas. Totalling nearly 2,000 acres, the areas are known to be inhabited by endangered Florida leafwing and Bartram's hairstreak butterflies. Craig Grossenbacher, chief of the county's Water Resources Coordination Division, said that Miami-Dade County also decided to stop spraying on a patchwork of environmentally endangered land inhabited by native butterflies.

Monroe County is making changes, too. The county is expanding the boundaries around endangered butterflies' habitats to 400 meters for aerial spraying and 250 meters for truck fogging, said Anthony Sowers, a toxicologist with the U.S. Fish and Wildlife Service.

Protecting The Public

While the drought made this mosquito season one of the mildest in years, mosquito managers say the new rules mean they will have to work a little harder at educating the public about the risks from stagnant water. Mosquitoes use water that is stagnant, or standing still, as a place to breed.

“It’s not going to be easy,” said Chalmers Vasquez, operations manager for Miami-Dade County Mosquito Control. “The population needs to be protected before the butterflies.”

Mosquito season typically starts about two weeks after the rainy season, when salt marsh mosquitoes get blown inland from the Everglades National Park or Biscayne Bay's tangled mangroves. So far this year, Vasquez said the district has sprayed just once, at a half dozen parks, before the July 4 holiday.

Standing water in pots and plants has so far posed a bigger concern.

Vasquez has found that the bromeliad flower is causing particular problems.

More Butterflies Land On The Endangered List

Risks linked to spraying date back to at least the 1990s, when researchers began connecting the decline in butterflies to pesticides. Worry only increased in recent years as the butterfly population continued to drop. In 2013, federal officials declared two Florida species extinct. A report found three more have probably disappeared, largely the result of their habitats being razed for development and pesticide spraying.

Just last year, the leafwing and hairstreak butterflies were added to the endangered species list, bringing the total number of endangered butterfly species in the state to four. Another three are considered threatened.

One solution is to do a better job of managing butterflies' habitats, particularly on Big Pine Key where Keys residents have come to rely on spraying for mosquitoes to make the summer months tolerable. Ocean winds easily carry pesticides to nearby butterflies' habitats, though, and federal officials decided it was time to take a closer look at toxicity, Sowers said.

"Everyone went into it with the understanding they are insecticides. They are insects. There is going to be some toxicity," he said. "The goal was to see what type of exposure was needed for impacts to occur."

Without A Wing Or A Prayer

For his study, Rand selected five Florida species he purchased from a breeder in Naples. He chose the common buckeye, painted lady, zebra longwing, atala hairstreak and white peacock butterflies. Then he focused on naled, permethrin and dichlorvos, the most common pesticides used in spraying for mosquitoes across South Florida.

He coated leaves with the chemicals and used a hole puncher to create tiny servings for the caterpillars. Rand also tested exposure for butterflies by spraying them, conducting separate tests to look at what happened when the pesticides landed on their thorax or on their wings.

Rand found that naled and permethrin, but not dichlorvos, harmed both butterflies and caterpillars. Permethrin also tended to pose a lasting risk since it stayed on leaves longer.

“If they’re spraying according to the label rate and doing a proper job, you wind up with concentrations that produce acute toxicity to a number of species,” he said.

Despite the findings, Rand said he is not opposed to pesticide use.

“I’d love for the whole world to be organic farming, but I don’t think it’s possible,” he said. Instead, he said his findings should be used as a warning about how pesticides are applied. “Everybody complains about farmers, but you’ve got massive amounts of spraying outside by people. What other organisms are out there being depleted that we don’t know about? And we won’t know until it’s too late.”