

Project EAST: Fire Ants or No Fire Ants?

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Abstract:

The Project EAST program rises to the top as a best practices model. Currently serving 450 students on four Islands, the mission of EAST is to promote critical thinking and problem solving skills, by engaging students in an educational environment steeped in emerging technologies and community based learning.

Project EAST student, Shanoa Miller utilized GIS to answer the burning question -- “Fire Ants or no Fire Ants”? She conducted research in partnership with the University of Hawaii to research the existence of fire ants on the Island of Maui. The Fire Ant species, if found, would cause havoc on our fragile ecosystem.

GPS and GIS technologies were used to map the ant collection data and results. The ant identification process resulted in the collection and discovery of 16 different ant species. The Fire Ant was not discovered, but government involvement by increasing field surveys for invasive insects is ongoing.

Introduction:

As a science fair and EAST project I conducted a field survey in highly probable immigrating insect entry zones specifically looking for the Red Imported Fire Ant (*Solenopsis invicta*) and the Little Fire Ant (*Wassmania auropunctata*). In Hawaii there are no native ant species, yet there have been 44 different ant species identified. Although it is highly possible that the Red Imported Fire Ant (RIFA) and the Little Fire Ant (LFA) exist on Maui, it has not been documented or confirmed.

On an island such as Maui, the entry port for a fire ant or any insect is through incoming ships or aircraft carrying domestic and foreign agriculture. These two species of fire ants are known to cause havoc and would greatly devastate Maui's fragile ecosystem and lifestyle. The fire ant obtains its name for its vigorous sting that feels like fire when inflicted on a person or an animal. These fire ants are known to be a nuisance to humans. They can destroy our economy through our irrigation systems, infect our crops and animals, and hinder our recreational activity locations such as beaches and parks. Certain fire ants are also known to chew into insulation of electrical equipment causing short circuits. The fire ant may cause extinction or a decrease in population of animals such as turtles, geckos (Hawaiian lizard), and the already endangered species of native Hawaiian birds. Birds play a major role in Hawaii's ecosystem by eliminating insects and pollinating Hawaii's native plant species. Geckos are significant for their contribution to maintaining the balance of unwanted insects. Although most of Hawaii's native insects have already been decimated by the ants that have already made it here.

A field survey was conducted at the Lahaina Harbor, Mala Ramp/Wharf, and Kahului Airports, while using safety precautions in collecting ant species using bait vials containing chicken, peanut butter, and honey. The ants were then identified using the “Key to the Ants of Hawaii” by Neil J. Reimer. This process was learned through Entomologist William Haines from the University of Hawaii.

A GPS system was used to make an interactive map of the ant collection data. The information and GPS maps from this project would greatly benefit the Department of Agriculture at both the Hawaii State and Federal Levels. If the RIFA and/or LFA was found or documented this data could pinpoint the exact location that would need to be quarantined and exterminate the fire ants. The Federal and Hawaii State Department of Agriculture could also use this information to increase their insect screening procedures at both air and sea ports in Hawaii. Additional smaller local organizations currently active in preserving Hawaii’s ecosystems such as the Maui Invasive Species Committee and the Conservation Council of Hawaii would also benefit greatly. These local organizations have recently been focusing on monitoring the Little Fire Ant on the islands of Kauai and Hawaii where the LFA was recently discovered and confirmed.

The results of this project consisted of the discovery of 16 different ant species. One of which was related to the Red Imported Fire Ant. The ant *Solenopsis geminata* was found at the Kahului Airport, Kahului Harbor, and the Lahaina Harbor. *Solenopsis geminata* is also known as the Tropical Fire Ant and has been sighted through out the state of Hawaii. This ant is a stinging ant but is not as potent or destructive as the RIFA.

My field survey resulted in negative findings of the Red Imported Fire Ant (*Solenopsis invicta*) and the Little Fire Ant (*Wassmania auropunctata*) in selected areas

of immigrating insect entry zones on the Island of Maui. There is however great concern and high probability of existence of these ant species on Maui, as the LFA has been confirmed on the Big island of Hawaii and the island of Kauai. This survey was encouraged by the fact that I did not believe fire ants existed in destructive numbers on Maui or that our lifestyles could be threatened by these species of ants.

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Shanoa Miller: Miss Shanoa Mahealani Iwano Miller is a recent graduate of King Kekaulike High School in Pukalani, Maui. With an interest in Science and Technology, Shanoa was a member of Environmental and Spatial Technology (EAST) and Biotechnology Programs in school. Shanoa also completed an internship at the University of Hawaii with Dr. Rodrigo Almeida during the 2005 summer. The internship included working with many different entomologists and their various research projects using biotechnology techniques and GIS software. In 2005 and 2006, she was also involved in the Hawaii State Science and Engineering Fair. For her project “ A Search for the Red Imported Fire Ant and the Little Fire Ant, A Second Year Study,” she collaborated with entomologist William Haines from the University of Hawaii, who taught her how to identify the different ant species in Hawaii.

Shanoa will be attending the University of Arkansas at Little as an EAST Scholar in the fall of 2007. She will major in Information Science with a minor in bioinformatics and would like to pursue a PhD in Biomedical Engineering.

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