

## Progress Report

<b>Title:</b>	<b>Guam Forest Insect Survey</b>		
<b>Sponsoring Agency</b>	NIFA	<b>Project Status</b>	ACTIVE
<b>Funding Source</b>	Mcintire Stennis	<b>Reporting Frequency</b>	Annual
<b>Accession No.</b>	1005269	<b>Project No.</b>	GUA0903
<b>Project Start Date</b>	11/28/2014	<b>Project End Date</b>	09/30/2018
<b>Reporting Period Start Date</b>	11/28/2014	<b>Reporting Period End Date</b>	09/30/2015
<b>Submitted By</b>	Rachael Leon Guerrero	<b>Date Submitted to NIFA</b>	02/21/2016

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**Recipient Organization**

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**Non-Technical Summary**

Despite the fact that Guam's forest ecosystems are rapidly being degraded by invasive insect species, such as the Asian cycad scale, *Aulacaspis yasumatsui*, the coconut rhinoceros beetle, *Oryctes rhinoceros*, and the little fire ant, *Wasmannia aurapunctata*, little is known about Guam's forest insects and their impacts on forest health. Discovery of three species of bark beetles not previously reported from Guam in a single trap at a single location [Moore, unpublished] illustrates this lack of knowledge.

Support is requested for a Guam forest insect survey which will fill some of the gaps in our knowledge base.

**Accomplishments****Major goals of the project**

The objective of the proposed survey is to build a knowledgebase on insects associated with plants in Guam's forests. The survey will result in a reference collection of Guam's forest insects and a publicly available online database to facilitate sharing of specimen data, images and ecological associations among plants and insects.

The knowledgebase will be useful to natural resource managers responsible for maintaining the health of Guam's forests and to biologists trying to understand Guam's terrestrial ecosystems in the wake of major biological invasions.

**What was accomplished under these goals?**

A web application named CheckList Plus (CLP) was designed and developed to facilitate databasing and accessing information on Guam's forest pests. All organisms in CLP are linked to taxa in the taxonomy database maintained by the National Center for Biotechnology Information (NCBI). The NCBI taxonomy database is essentially a digitized tree of life which includes scientific names and synonyms including common names. Unlike many biodiversity databases, CLP allows definition of trophic links between taxa. This allows queries to find all insect herbivores which feed on a particular host plant, or conversely, to find all host plants on which a particular insect feeds. The CLP is currently being populated with data from several sources: the scientific literature and specimen data from the University of Guam Insect Collection.

Many specimens of forest insect pests collected by the Guam Plant Extinction Prevention Program, the Guam National Wildlife Refuge, and other collaborators were accessioned into the University of Guam Insect Collection during the reporting period. Most of these specimens await identification by a taxonomist.

**What opportunities for training and professional development has the project provided?**

Informal training in insect specimen collection and preservation was provided to staff of the Guam Plant Extinction Prevention Program (GPEPP) during several visits to the project's nursery and field sites. In some cases, pest control recommendations were provided.

## Progress Report

Accession No. 1005269

Project No. GUA0903

**How have the results been disseminated to communities of interest?**

Fact sheets on newly arrived invasive insect species were prepared and these are available to the public in print and on-line.

**What do you plan to do during the next reporting period to accomplish the goals?**

I plan to offer a workshop to staff of the Guam Department of Agriculture Forestry Division on survey and collection methods for forest insect pests.

I plan to submit two refereed journal articles on recently arrived bark beetles species.

I plan to host a visiting taxonomist to help identify a large backlog of unidentified specimens submitted to the University of Guam Insect Collection. A student technician will be hired to coincide with the taxonomist's visit.

**Participants****Actual FTE's for this Reporting Period**

Role	Non-Students or faculty	Students with Staffing Roles			Computed Total by Role
		Undergraduate	Graduate	Post-Doctorate	
Scientist	0.1	0	0	0	0.1
Professional	0	0	0	0	0
Technical	0	0	0	0	0
Administrative	0	0	0	0	0
Other	0	0	0	0	0
Computed Total	0.1	0	0	0	0.1

**Student Count by Classification of Instructional Programs (CIP) Code**

{NO DATA ENTERED}

**Target Audience**

I provided information to the Guam Plant Extinction Prevention Project staff and the United States Fish and Wildlife Service staff at the Guam National Wildlife Refuge. This information included identification of insect specimens given to me and recommendations on plant protection.

Fact sheets on newly arrived invasive species were prepared and made available to the public in print and on web site.

**Products**

Type	Status	Year Published	NIFA Support Acknowledged
Journal Articles	Published	2014	NO

**Citation**

Fisher, Nicole, Aubrey Moore, Bradley Brown, Matthew Purcell, Gary Taylor, and John Salle. 2014. "Two New Species of *Selitrachodes* (Hymenoptera: Eulophidae: Tetrastichinae) Inducing Galls on *Casuarina* (Casuarinaceae)." *Zootaxa* 3790 (4): 534-542. <http://biotaxa.org/Zootaxa/article/view/zootaxa.3790.4.2/7933>.

Type	Status	Year Published	NIFA Support Acknowledged
Journal Articles	Published	2015	NO

**Citation**

Moore, Aubrey, Trevor Jackson, Roland Quitugua, Paul Bassler, and Russell Campbell. 2015. "Coconut Rhinoceros Beetles ( Coleoptera : Scarabaeidae ) Develop in Arboreal Breeding Sites in Guam." *Florida Entomologist* 98 (3): 1012-14. <http://journals.fcla.edu/flaent/article/download/84794/84044>.

## Progress Report

Accession No. 1005269

Project No. GUA0903

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2015	NO

**Citation**

Ares, M. A., N. Meneses, A. Smith, Aubrey Moore, and R. Benford. 2015. "Molecular Identification of a Lepidopteran Herbivore on a Critically Endangered Tree." In Northern Arizona Undergraduate Symposium.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2015	YES

**Citation**

Moore, Aubrey, and Western Pacific. 2015. "Failure Analysis of the Guam Coconut Rhinoceros Beetle Eradication Project Aubrey Moore Western Pacific Tropical Research Center." In Pacific Entomology Conference, 1–2. Honolulu.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2015	YES

**Citation**

Moore, Aubrey, and Roland Quitugua. 2015. "Coconut Rhinoceros Beetle Trap Improvements." In Pacific Entomology Conference. Honolulu. <http://guaminsects.net/anr/sites/default/files/pec2015-improved-traps.pdf>.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2015	YES

**Citation**

Moore, Aubrey. 2015. "A Report on the Guam Coconut Rhinoceros Beetle Infestation." In Pacific Plant Protection Organization. Nadi, Fiji.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2015	NO

**Citation**

Marshall, Sean David Goldie, Maclean Vaqalo, Aubrey Moore, Roland Quitugua, and Trevor A Jackson. 2015. "A New Invasive Biotype of the Coconut Rhinoceros Beetle (*Oryctes Rhinoceros*) Has Escaped from Biocontrol by *Oryctes Rhinoceros Nudivirus*." In International Congress on Invertebrate Pathology and Microbial Control and the 48th Annual Meeting of the Society for Invertebrate Pathology. Vancouver, BC. <http://www.sipmeeting.org/van1/SIP2015-FullProgram.pdf>.

Type	Status	Year Published	NIFA Support Acknowledged
Other	Published	2015	NO

**Citation**

Vaqalo, Maclean, Sean Marshall, Trevor Jackson, and Aubrey Moore. 2015. "Pest Alert 51: An Emerging Biotype of Coconut Rhinoceros Beetle Discovered in the Pacific." Suva, Fiji: Secretariat of the Pacific Community, Land Resources Division.

**Other Products**

{Nothing to report}

**Changes/Problems**

A planned visit by an insect taxonomist to assist in identification of a large backlog in the University of Guam Insect Collection did not happen during the reporting period because of scheduling problems. A visit by a taxonomist is being

**Progress Report**

**Accession No. 1005269**

**Project No. GUA0903**

planned for 2016.