PACIFIC ISLANDS
APRIL 2012

Forest Health *2011 highlights*

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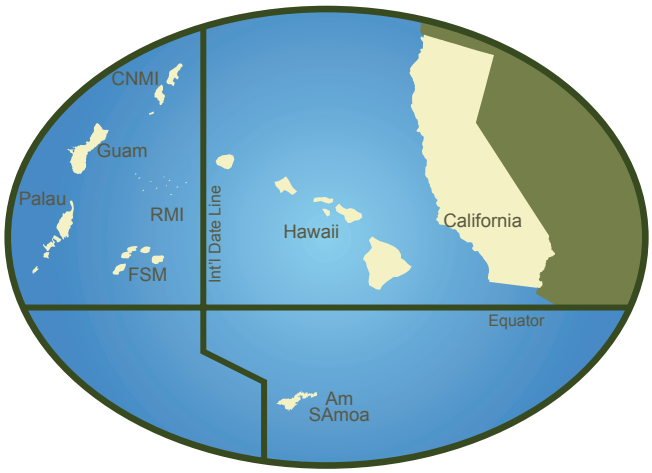
Forest Resource Summary

The US-affiliated Islands of the western Pacific cover an area larger than the continental United States, with a total land mass of 965 square miles. The area includes the Territories of American Samoa and Guam, the states of Chuuk, Kosrae, Pohnpei, and Yap in the Federated States of Micronesia (FSM), the Republics of Palau and the Marshall Islands, and the Commonwealth of the Northern Mariana Islands (CNMI). Approximately 325,000 acres are forested.



U.S. Affiliated Islands in relation to the United States

Forests in the Pacific are host to a variety of pests and pathogens and are subject to natural and human-caused disturbances which adversely affect forest health. Forest health issues vary widely among islands and most pest issues result from the multiple pathways for introduction due to the prevalence of travel and trade throughout the Pacific.

Invasive plants remain one of the greatest forest health issues on the islands, all of which have active invasive plant survey and control programs. Invasive insect introductions are becoming more frequent increasing the need for early detection and control tools.

Climate Change effects on Food Security

Climate change poses a significant long-term threat to food security and traditional livelihoods in the Pacific Islands. Extreme changes in temperature and rainfall affect agricultural yields and the crops that can be grown for sustainability. Increasingly extreme weather changes and patterns may result in production losses due to heat stress, drought conditions and waterlogging, increased flooding of river catchments and soil erosion. All Pacific Island states/territories list food security and watershed conservation as high priority conservation issues.

Changes in rainfall pattern, temperature and wind directions could also result in the introduction and establishment of new pests and disease carrying vectors, especially insects, further threatening production. Predicted increases in humidity levels, which are supportive of plant fungal diseases, are capable of wiping out crops. Increases in pest and disease status and occurrences can also affect a country's ability to access export markets or lose existing markets.

Significant proportions of the population in Pacific Island states and territories live in coastal areas. Sea-level rises will increase coastal erosion and saltwater intrusion can contaminate groundwater sources leading to the loss of productive land. Atolls and other low lying areas are in a uniquely vulnerable position to sea-level rises given the limited agricultural land

Agroforestry on the Island of Tutuila, American Samoa.
Photo: Neil Gurr

currently available. Increased salt water intrusion limit what can be grown in these harsh environments and exacerbate existing threats to food security. This is likely to increase reliance on imported processed food stuffs and worsen existing health problems relating to lifestyle diseases. Managing water resources may become more difficult and costly as a result of changes in rainfall patterns and salt water intrusion.
Reference: www.spc.int and www.wflccenter.org/islandforestry

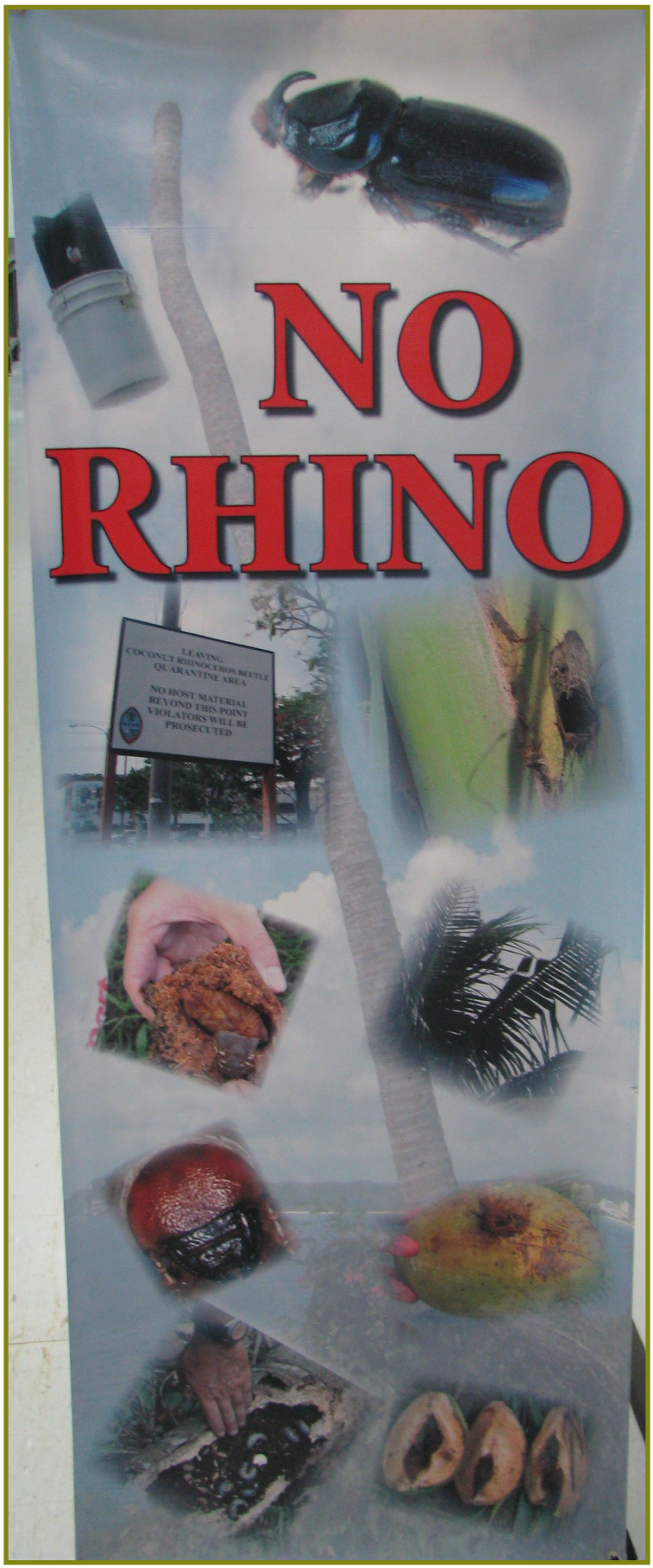
Abiotic Conditions

The state of the climate during 2011 began as strong La Niña. La Niña waned over the course of the first few months of 2011, and conditions evolved to ENSO (El Nino/Southern Oscillation)-neutral by the summer. Weather patterns across Micronesia during the first half of 2011 included very strong and persistent easterly surface winds and a westward displacement of tropical cyclone activity. In response to the strong easterly low-level wind anomalies, sea level across Micronesia remained higher than normal during all of 2011. Rainfall anomalies, less than 75% of normal occurred in the Republic of the Marshall Islands (Wotje and Woleai) whereas higher than normal rainfalls were experienced in Palau, Yap, Rota, Saipan and Tinian. Oceanic and atmospheric patterns across the Pacific reflect the continuation of a weak to moderate La Niña.
Reference: www.prh.noaa.gov/peac/peu/2012_1st/PEU_v18_n1.pdf

Coconut Rhinoceros Beetle on Guam

Coconut rhinoceros beetle (CRB), *Oryctes rhinoceros*, was first detected on Guam in September, 2007. It is native to Southeast Asia and now occurs throughout much of the Western Pacific. It is a serious pest of coconut palm, *Cocos* nucifera, betelnut, *Areca catechu*, and *Pandanus* species. Following a delimiting survey which indicated the Guam CRB population was limited to a small area, the Guam CRB Eradication Project was launched using the Integrated Command System. Initially the project included two tactics: mass trapping of adults and sanitation of breeding sites by removal and destruction of infested decaying vegetation. Over the past four years research has been concurrent with the eradication project: efforts to improve survey and detection techniques have included trap/lure studies, the use of acoustic equipment, mark-release-recapture studies, the training of detector dogs, and the development of training programs to educate the public on the signs of damage caused by CRB. Multiple control techniques have been investigated including the use of conventional insecticides, insect growth regulators, biological insecticides, and biological control using various strains of viruses but none have succeeded in knocking down this invader.

During early 2011, CRB escaped from the quarantine zone along the northeast coast of Guam and spread to inland areas where adults established breeding sites in large compost piles. In addition, during March 2011, a large infestation of CRB was discovered at the northern tip of Guam, at the Guam National Wildlife Refuge at Ritidian Point. Multiple breeding sites were discovered in a large, abandoned copra plantation. It appears unlikely at this point that eradication of CRB on Guam is going to be successful. Pest surveyors on other islands need to remain vigilant in looking for signs and symptoms of CRB; as the Guam CRB population continues to increase, the potential



"No Rhino" poster used on Guam to increase public awareness.

for it to escape the island also increases. Recently Guam was granted a permit to import and release spores of *Metarhizium*, a soil inhabiting fungus being produced for CRB biocontrol by the Philippines Coconut Authority. Hopes remain high that this fungus will be effective in controlling CRB populations.

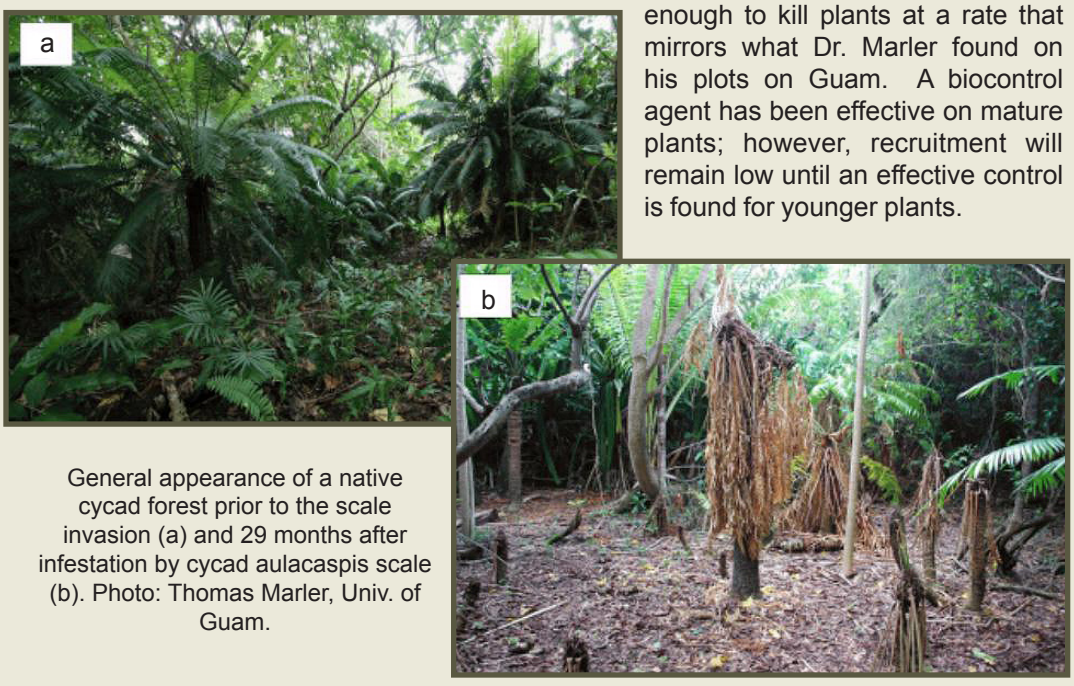
Little fire ant, *Wasmannia auropunctata*, on Guam

The little fire ant (LFA), *Wasmannia auropunctata* was detected on Guam in late 2011 by staff of the Guam Coconut Rhinoceros Beetle (CRB) Eradication Project as they were being bitten by the ants while unloading plant material at the dump. Islanders have been on the lookout for LFA since 2007 with surveillance projects on Guam and in the CNMI. This tiny non-descript ant can be found both on the ground and in vegetation. They climb onto plants of all sizes, including trees, but they easily drop off when the vegetation is disturbed. Activities such as pruning branches or harvesting fruit cans cause LFA to fall off in large numbers. Pets, livestock, wild animals and humans are at risk for LFA stings. While the sting of an individual ant is not in itself painful, the ants sting en masse which may cause persistent, intense itching and a rash. LFA was detected in Hawaii in 1999, although the Hawaii Department of Agriculture worked to contain the initial infestation, the ant had been inadvertently spread from on infested plants from nurseries. Commercial, recreational, or residential uses of property can be negatively affected by a LFA infestation.

Little fire ant. Photo: itp.lucidcentral.org/id/ant/pia/Fact_Sheets/

Update on cycad plant health on Guam and Rota

Cycad aulacaspis scale (CAS), *Aulacaspis yasumatsui* invaded Guam in 2003. Since initial detection, the scale has been monitored by Dr. Thomas Marler, University of Guam, in part, with funds from the Cooperative Lands Forest Health Management Program (USDA Forest Service, R5) and the American Recovery and Reinvestment Act (2009). Cycad mortality has been high in his plots, reaching 92% by January 2011. Although efficacy of the biological control agent, Rhyzobius lophanthae, released in 2005 to control the scale, is described by Dr. Marler as “reasonable” on mature plants, it has proved ineffective at controlling the scale on seedlings. Other insects contributing to the cycad mortality include a native stem borer, *Dahammus marianarum* and the invasive blue butterfly, *Chilades pandava*. The loss of so many mature plants of a dominant native forest species in such a short amount of time combined with no recruitment of seedlings could be devastating to the balance of Guam’s forest ecosystems. CAS invaded Rota in 2007; *R. lophanthae* were quickly released to control scale populations but similar to what occurred on Guam, the biological control agent failed to protect seedlings from scale infestation and ultimately mortality. The combination of plant injury caused by the scale and blue butterfly on Rota has been enough to kill plants at a rate that mirrors what Dr. Marler found on his plots on Guam. A biocontrol agent has been effective on mature plants; however, recruitment will remain low until an effective control is found for younger plants.



General appearance of a native cycad forest prior to the scale invasion (a) and 29 months after infestation by cycad aulacaspis scale (b). Photo: Thomas Marler, Univ. of Guam.

Juvenile cycads (stumps in foreground) killed by cycad aulacaspis scale on Rota. The scale migrated into this area in April 2008; plants were dead by September 2009. Healthy mature cycad in rear left corner show evidence that the biological control is more effective on mature plants than immatures.
Photo: Thomas Marler, Univ. of Guam

Agents of concern in agroforests on Yap

Breadfruit on Yap is seasonal, it is secondary to taro on the main island as a food source, but is a main staple food on the atolls. It generally bears fruit when yam harvesting season is coming to an end and is an important component of the agroforest which provides many benefits including food, timber, medicine, and wildlife habitat.

Breadfruit on the outer islands and some breadfruit growing in coastal areas on the main islands are stunted or dying because of salt water intrusion. Now, in addition to this problem, various communities have recently been calling the Division of Agriculture and Forestry for assistance because the branches on their breadfruit are dying and the bread fruit is not bearing fruit. Upon investigation, they found that a borer is the cause of the stunting or death of all the young branches, and they believe the insect is a breadfruit twig borer. Confirmation of identification is ongoing.

This borer has been recently established in Yap. It lays eggs at the nodes of young shoots of breadfruit. The eggs hatch and the larvae bore a hole into the pith where the leaf petiole is attached to the nodes and then they cover the hole. The larvae stay in the pith passing the pupal stage and emerge as adults. The part of this insect's life cycle that is spent in the pith of young branch of the breadfruit greatly reduces breadfruit production. The presence of this borer now threatens the remaining breadfruit trees that have escaped saltwater intrusion. Some of the young branches that do not die, and continue to grow to maturity are much weaker and very susceptible to breaking during extreme weather events or when the branches get heavy with mature fruit.

The red dots are current fruit fly trapping sites on Yap; the yellow dots are the new proposed sites.

Pith of breadfruit tunneled out by the larval stage of the borer.

Arboriculture Class: Pohnpei 2011

Objectives of the course included:

1. Teaching disease and insect information in Pohnpei;
2. Aid the forestry departments of five island states in the Federated States of Micronesia to understand administrative functions in the US Forest Service;
3. Work on three kinds of root rot problems that are having an adverse effect on the health of native trees in forests of the Pacific Islands;
4. Collaborate with the University of Guam researchers to develop a system to handle the extensive dieback problem affecting Casuarina trees in Guam;
5. To explain the nature of *Puccinia psidii*, an exotic rust fungus, which could have a sizeable impact on Myrtaceous species across the Pacific.

Twenty people from the Federated States of Micronesia attended this successful course.

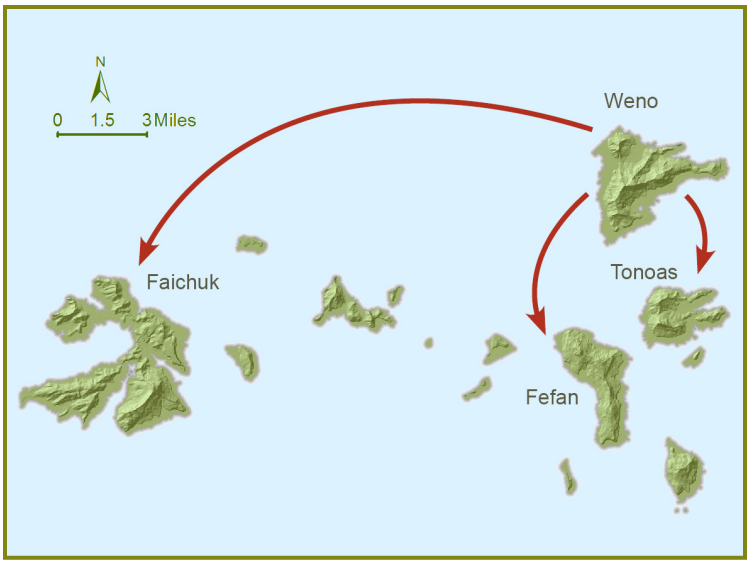
Arboriculture Class, Pohnpei, 2011. Photo: Phil Cannon

Citrus fungus disease on Chuuk.

Citrus fungus disease has been impacting vegetation on Chuuk. *Derris elliptica* extract, a local pesticide, is being used to help control the fungus. The pesticide has been tested by the Development of Sustainable Agriculture in the Pacific (DSAP), formerly under the Secretariat of the Pacific Community (SPC).

Honolulu rose is an invasive plant species in the Federated States of Micronesia, especially Chuuk. This invasvie plant spread in the past year from Weno to Fefan, Tonoas, and islands in the Faichuk region of Chuuk. Honolulu rose competes with local food crops for soil nutrients and water.

Citrus psyllid on American Samoa is very active. Surveys in 2011 provided data to a larger study in Australia trying to determine how this pest spread so quickly to so many places in the last decade.



Movement of Honolulu rose within the Chuuk Islands in the past year. Map: Zhanfeng Liu and Meghan Woods

Adult Asian citrus psyllid, *Diaphorina citri* Kuwayama. Photo: Douglas L. Caldwell, University of Florida

A newly found small population of the highly invasive plant *Imperata cylindrica* (cogon grass) was found on Saipan in the Commonwealth of the Northern Mariana Islands. This invasive grass, once established, alters fire regimes and grows into dense single species stands. It is a problem throughout southeast Asia, in the Pacifc, including Palau, Yap, and Saipan. It is also a big problem in the southeast United States.

Other highlights for invasive plants on all islands in the region include:

- Community Awareness workshops
- Elementary and Secondary education awareness on invasive plant species
- 2011 Pacific Islands Partners conducted an Education Awareness Symposium and hosted 800 teachers

Cogongrass flowers (*Imperata cylindrica*). Photo: Chris Evans, River to River CWMA

Cogongrass plants. Photo: Jeffrey W. Lotz, FL Dept of Agriculture and Consumer Services

Data Sources
The data sources used for this report include data gathered by USDA Forest Service, Pacific Southwest Region, Forest Health Protection staff and the Territorial Foresters of the US–affiliated islands (funded in part by Forest Service's Forest Health Programs).

The USDA Forest Service's Forest Health Aerial Survey Program is not currently active in the Islands.

For more information visit:
USDA Forest Service, Pacific Southwest Region - www.fs.usda.gov/main/r5/forest-grasslandhealth

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