

Guam's Native Forests are Being Destroyed by Invasive Species

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Birds Exterminated by Brown Treesnake: Ecosystem Services Lost

- ▶ Accidentally introduced by U.S. Military in late 1940s
- ▶ Guam's forest birds are gone because of snake predation
- ▶ Ecosystem services provided by birds also gone: seed dispersal, pollination, insectivory

Overbrowsing by Ungulates

- ▶ Much of Guam's forest is heavily damaged by deer and pigs which preferentially browse on native plants.
- ▶ Especially true on forested land occupied by the military, where hunting is prohibited. Andersen Air Force Base has deer population densities as high as anywhere in the world.

Endemic Cycad Attacked by Asian Cycad Scale

- ▶ *Cycas micronesica* was listed as the most populous tree-sized plant (DBH>5") in the latest forest survey (Donnegan et al. 2002)
- ▶ Asian cycad scale, *Aulacaspis yasumatsui*, detected in 2003 on ornamental plants
- ▶ Infestation quickly spread to wild plants. By 2006, *C. micronesica* was placed on the IUCN Red List of Threatened Species.
- ▶ To date, 90% of Guam's *C. micronesica* have been killed.

Coconut Palms Attacked by Coconut Rhinoceros Beetle (CRB)

- ▶ *Cocos nucifera* was listed as the 2nd most populous tree-sized plant (DBH>5") in the latest forest survey (Donnegan et al. 2002)
- ▶ CRB was detected on Guam in 2007; adults kill palms by boring into the crown to feed on sap
- ▶ To date, the CRB infestation has spread to most of central and northern Guam
- ▶ 50% tree mortality is to be expected if CRB population levels are not kept in check

And Now the Little Fire Ant? ...

Many Invasive Species in Guam's Forests Remain Undetected

- ▶ Biological monitoring of Guam's forests is almost non-existent. We don't have a biodiversity inventory.
- ▶ Invasive species are almost always discovered accidentally, after establishment.
- ▶ Example: After the coffee berry borer (CBB) was discovered in Hawaii, I deployed a single CBB trap during Jan and Feb 2011 at a single site in a forested area on Guam. Trapped bark beetles (Scolytidae) were identified by Dr. Don Bright, Colorado State University.

This single trap, at a single location, caught 7 species of bark beetles 4 of which were not previously reported from Guam.