

Overview of Invasive Species Issues on Guam

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Pacific Ecological Security Conference

Palau, October 6, 2022

<https://github.com/aubreymoore/PESC-OIA-overview/raw/main/guam-overview.pdf>

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How bad is Guam's invasive species problem?

- Guam has 33 species listed in **100 of the World's Worst Invasive Species**
- Guam has 5 species listed in the **Top 10 World's Most Costly Invasive Species**.
- Guam's natural ecosystems, especially Guam's forests, are rapidly being destroyed by invasive species.

How bad is Guam's invasive species problem?

Dominant Trees in Guam's Forests are Threatened by Asian Cycad Scale (ACS) and Coconut Rhinoceros Beetle (CRB)

Threat	Species	Status	Tree count ¹	% of total tree count
ACS	<i>Cycas micronesica</i>	endemic	1,571,556	16%
CRB	<i>Cocos nucifera</i>	native	1,162,494	12%
CRB	<i>Heterospathe elata</i>	introduced	1,075,552	11%
	<i>Vitex parviflora</i>	introduced	902,990	9%
	<i>Leucaena leucocephala</i>	introduced	890,217	9%

Tree census data source: J. A. Donnegan et al. 2004. Guam's Forest Resources, 2002. Available from:

http://www.fs.fed.us/pnw/pubs/pnw_rb243.pdf

Priority Issue 1: Brown treesnake



Courtesy of USGS

Forest Birds before BTS



Forest Birds after BTS



Priority Issue 2: Asian Cycad Scale



Priority Issue 2: Asian Cycad Scale



Priority Issue 3: Coconut rhinoceros beetle



Priority Issue 3: Coconut rhinoceros beetle - Impacts



Priority Issue 4: Little fire ant



Priority Issue 4: Little fire ant - Impacts

- **Human health.** LFA stings cause painful welts and produce varying allergic reactions.
- **Animal health.** stings to animal eyes cause a clouding or keratopathy leading to blindness
- **Ecological impacts.** LFA is highly competitive and displaces other invertebrates and vertebrates in infested areas. Mutualisms between LFA and Hemiptera causes explosions of plant pests, dramatically decreasing plant health and productivity.
- **Economic impacts.** Heavily infested structures and properties become uninhabitable without treatment. Guam's tourist industry is expected to be impacted.

Challenges

Human Resources

- Professional scientific/technical capacity is low
- Guam suffers from the *taxonomic impediment*
- Guam does not have a terrestrial biodiversity inventory

Funding

- Invasive species projects on Guam are funded by many relatively small short-term competitive grants. Project management overhead (proposal writing and report writing) is very high, leaving little time to actually do the work.

Funding sources

- Department of Interior - Office of Insular Affairs
- USDA - Forest Service
- USDA - APHIS
- DOD
- Government of Guam - Invasive Species Tarrif

National/Territorial Invasive Species Plans

- Guam Invasive Species Management Plan <https://www.sprep.org/attachments/VirLib/Guam/nissap-2017-2019.pdf>
- Regional Biosecurity Plan for Micronesia and Hawaii
<https://pacific.navfac.navy.mil/About-Us/Regional-Biosecurity-Plan-for-Micronesia-and-Hawaii/>

Next steps

Find and implement solutions for priority issues

- **Brown treesnake.** Eradicate BTS from Cocos Island
- **Cycad aulacaspis scale.** Implement an effective, island-wide, self-sustaining biocontrol program which will allow natural reproduction of surviving cycads (as per recommendations by Dr. Ronald Cave)
<https://github.com/aubreymoore/CAS-biocontrol-seminar/raw/main/Cave-CAS-report-2022.pdf>)
- **Coconut rhinoceros beetle.** Implement an effective, island-wide, self-sustaining biological control program for CRB-G which will suppress populations, reduce damage and halt palm mortality.
- **Little fire ant.** Continue local outreach to slow spread; population control around ports, conservation areas, and beach parks; evaluation of biocontrol agents

The End - Thanks for listening.

**Invasive species aren't all bad.
They provide job security for biologists.**

