

# Invasive Alien Species

## Impacts and Solutions

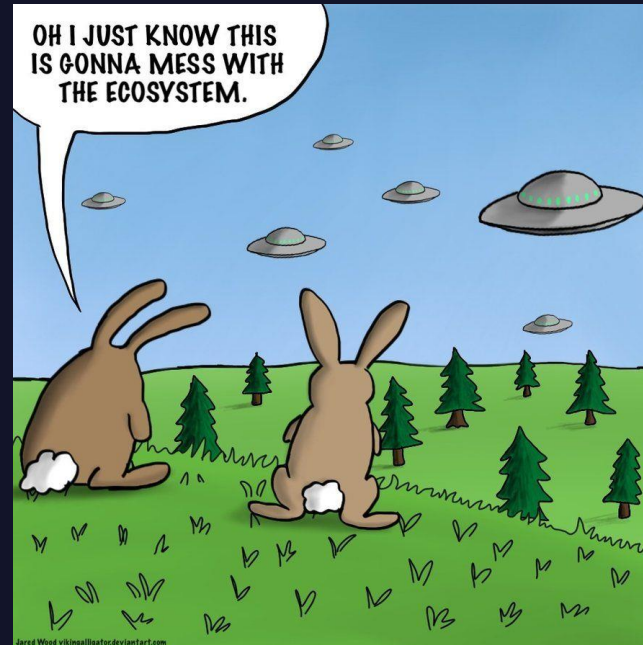
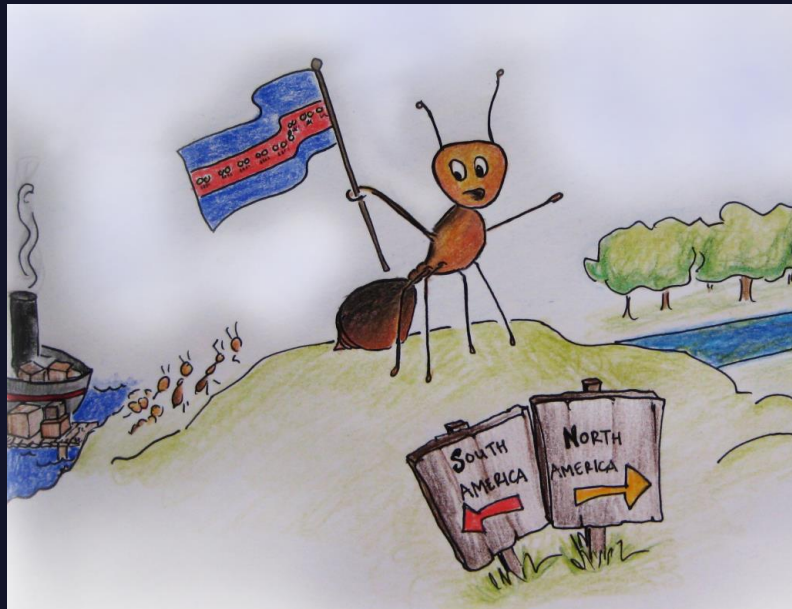
Patty Baiao, Ph.D.  
US Head of Operations



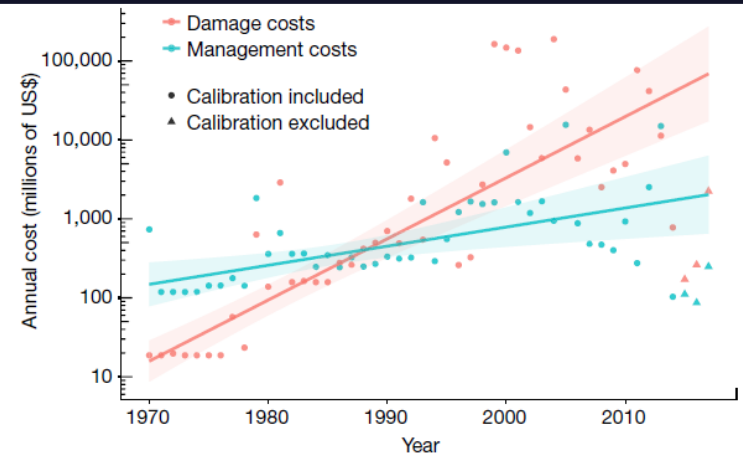
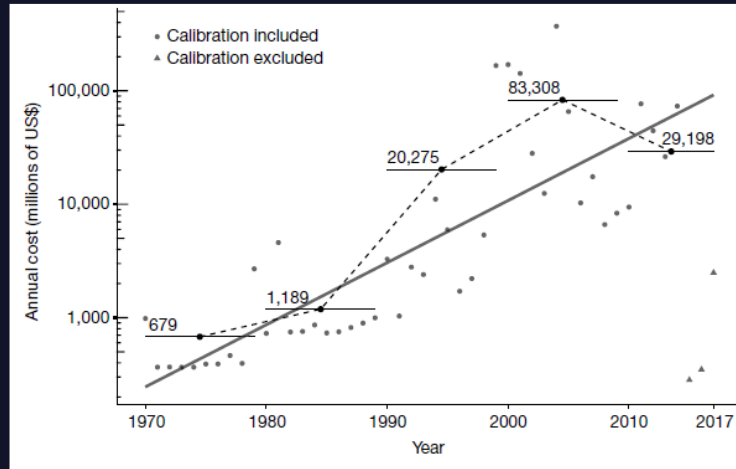
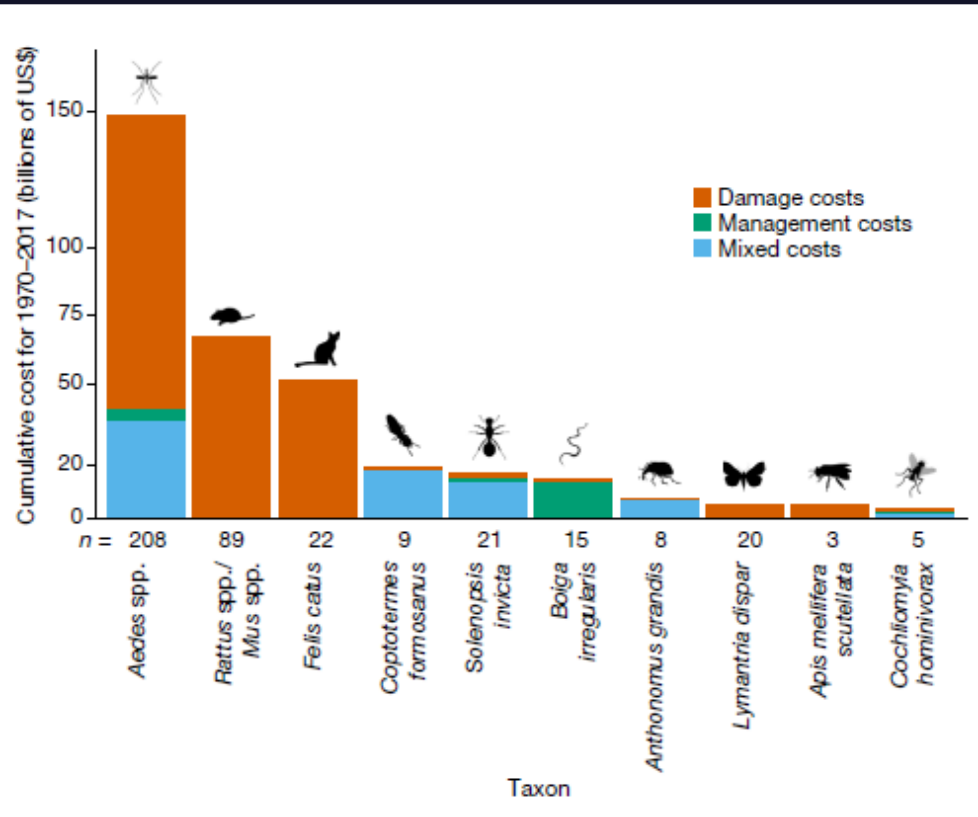
ISLAND CONSERVATION

# IAS Impacts

- Main driver of historical extinctions (40%).
- Major current threat to most listed species.
- Modify structure and species composition of ecosystems



# Cost of Biological Invasions (Diagne et al. 2021)



# Management and Control

- An ounce of prevention is worth a pound of cure – Biosecurity
- Early detection and Rapid Response (EDRR)
- Control Efforts
- Eradications

# ISLANDS REPRESENT



**5%**

Of the Earth's  
landmass



**19%**

Of avian  
biodiversity



**41%**

Of all highly  
threatened  
(Critically  
Endangered  
or Endangered)  
terrestrial  
vertebrates



**75%**

Of bird,  
amphibian,  
mammal,  
and reptile  
extinctions



**11%**

Of our world's  
population



**25%**

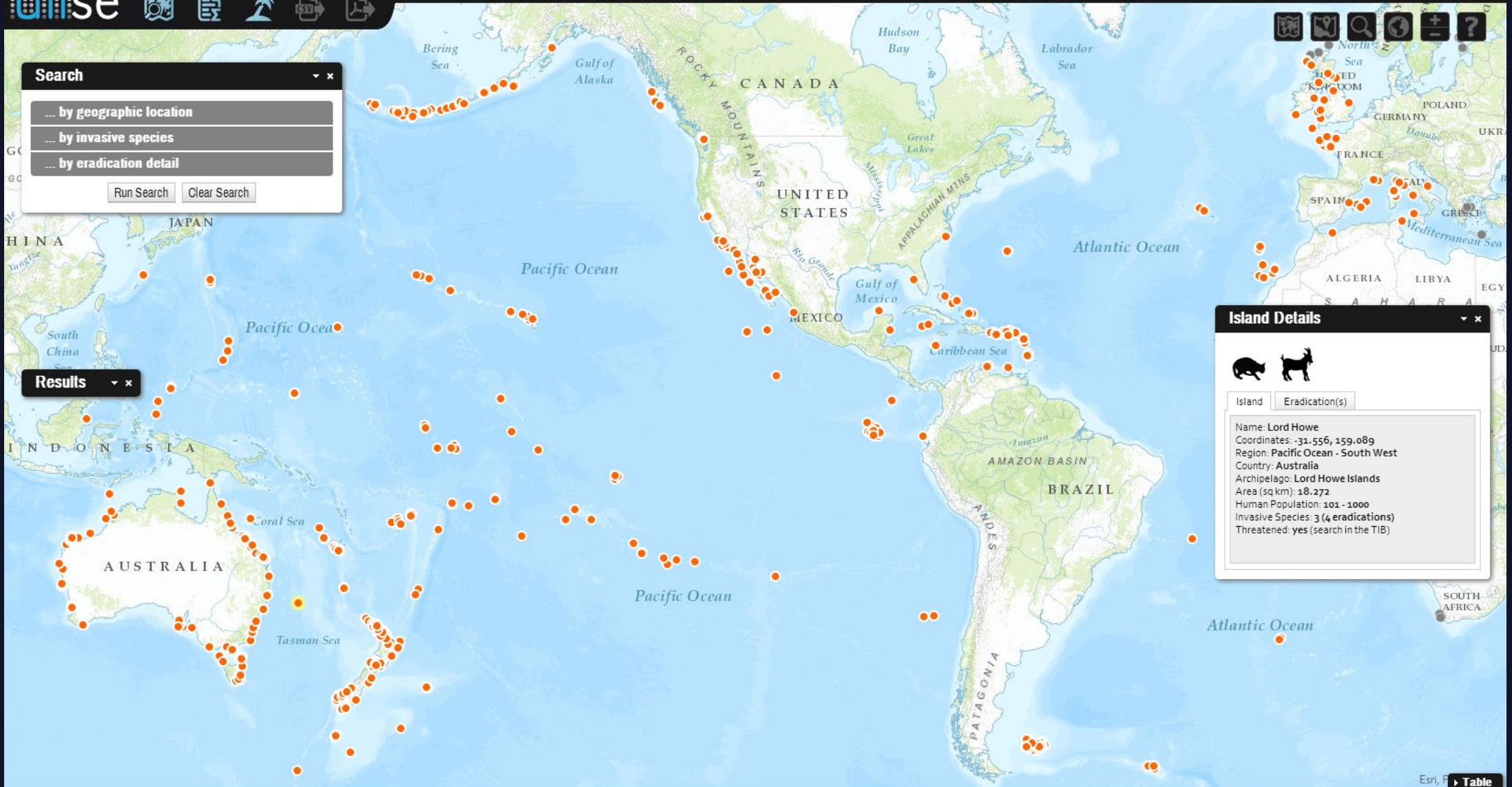
Of our world's  
nations



**86%**

Of all recorded  
extinctions on  
islands

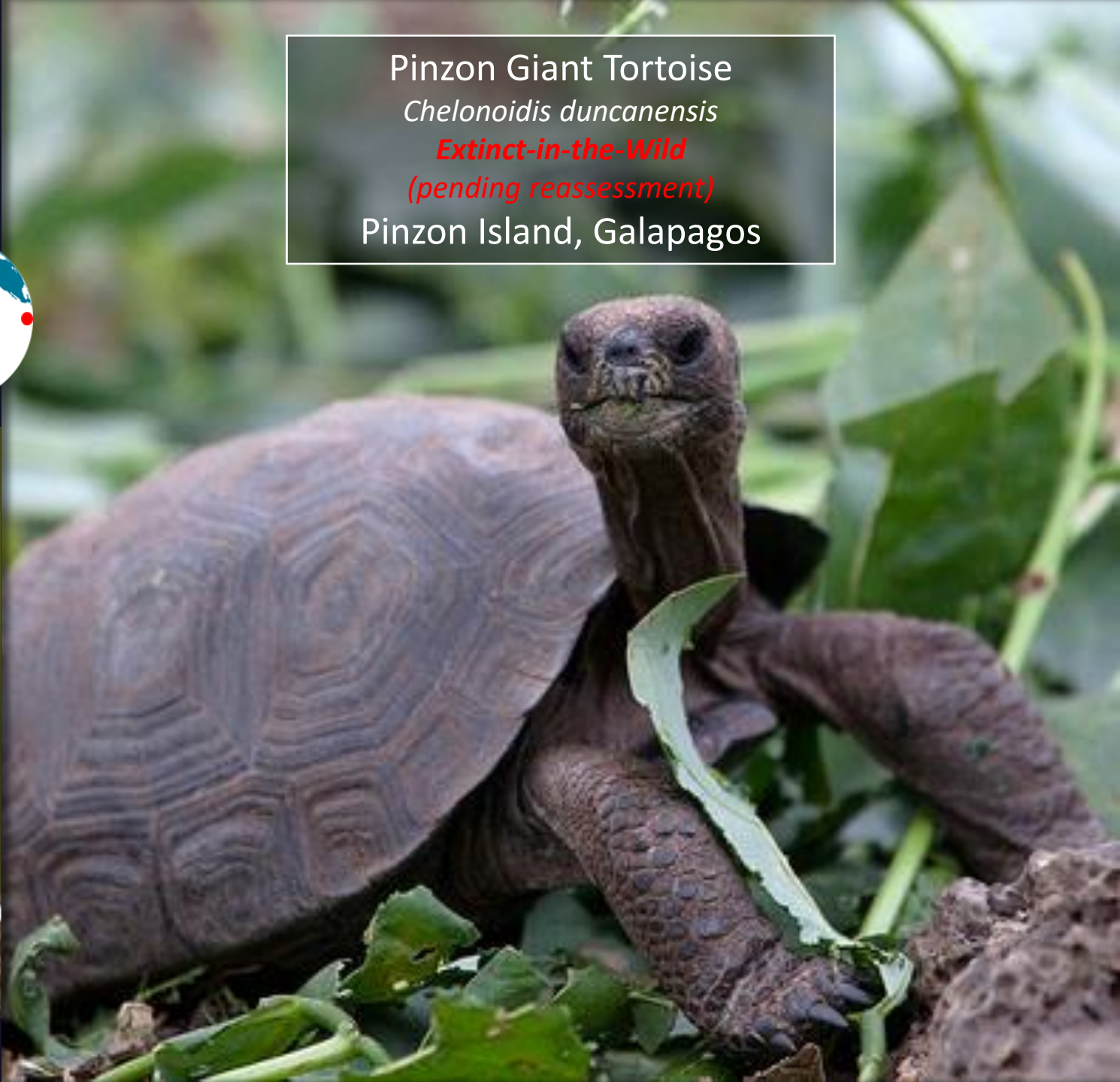
# BEYOND THE PROOF-OF-CONCEPT



# PINZON ISLAND, GALAPAGOS ISLANDS



Pinzon Giant Tortoise  
*Chelonoidis duncanensis*  
**Extinct-in-the-Wild**  
*(pending reassessment)*  
Pinzon Island, Galapagos



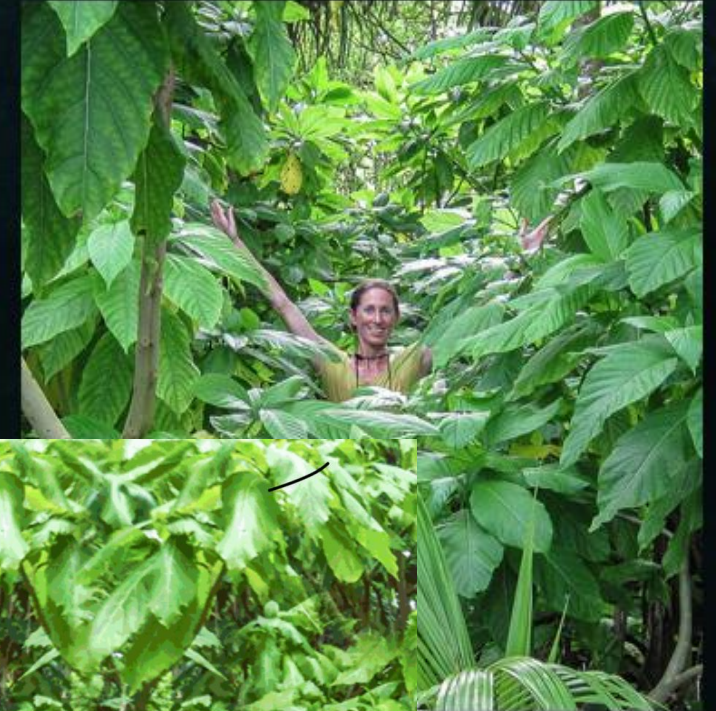
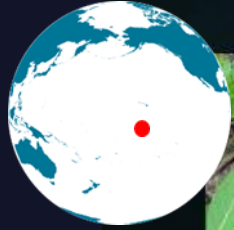
# PALMYRA ATOLL

## RECOVERING *PISONIA GRANDIS* FOREST

2011

2012

2014



2017  
5000%  
Increase

Wolf *et al.* 2018



# INVASIVES ON ISLANDS - A GLOBAL PROBLEM..

**tib** threatened island biodiversity database

ISLAND CONSERVATION | ISSG | BirdLife INTERNATIONAL | UNIVERSITY OF CALIFORNIA SANTA CRUZ

About | News | Disclaimer | Terms of use | How to Help | Contact

Basic | Satellite | Topographic

Search

- ... by geographic location
- ... by threatened species
- ... by invasive species

Run Search | Clear Search

RESULTS

Washington (Teraina)

Island | Threatened | Invasive

Name: Washington (Teraina)  
Coordinates: 4,712, -160,404  
Region: Pacific Ocean - North East  
Country: Kiribati  
Archipelago: Line Islands  
Threatened Species: 3  
Invasive Species: 4  
Eradication(s): no  
Human Population: 1001 - 10000

<http://tib.islandconservation.org>

built by the center for integrated spatial research (cisr)



Reach: **Only 0.3%** of all rodent-infested islands treated

Feasible: **~15%** – Threatened Sp. can be helped with current methods

We're **hitting the upper limits** of our tools and capacity

- Size

- Complexity

# How we **break the incrementalism** barrier?

## **Challenges**

- Logistics/Tactics

- + Ecological Risk

- + Legal/Regulatory

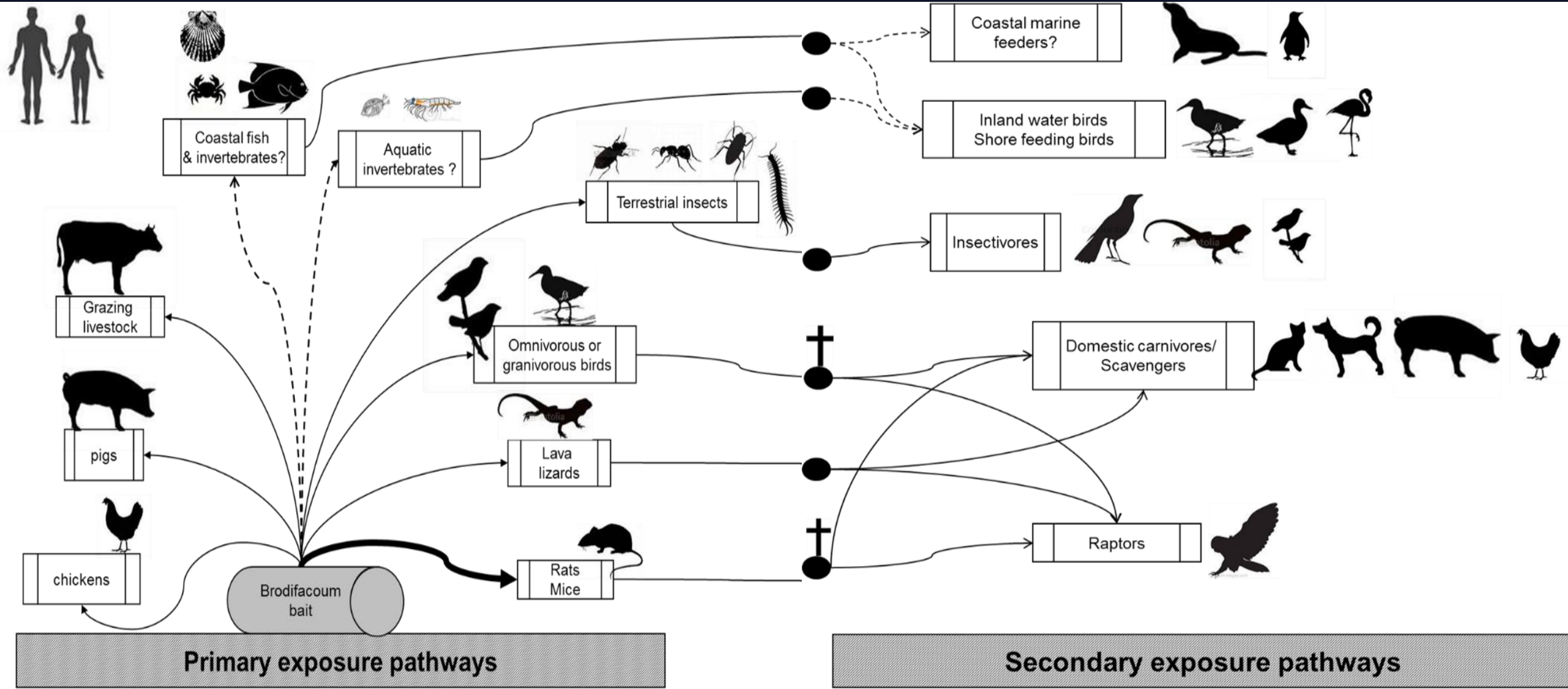
- + Social Political

- + Ethical

- + Financial

**= risks grow faster** as we scale up

# Floreana Island Galapagos, Ecuador



# Need for Innovation

Biological Conservation 185 (2015) 47–58



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Contents lists available at [ScienceDirect](#)

## Biological Conservation

journal homepage: [www.elsevier.com/locate/biocon](http://www.elsevier.com/locate/biocon)



Special Issue Article: Tropical rat eradication

The next generation of rodent eradications: Innovative technologies and tools to improve species specificity and increase their feasibility on islands



Karl J. Campbell<sup>a,b,\*</sup>, Joe Beek<sup>a</sup>, Charles T. Eason<sup>c,d</sup>, Alistair S. Glen<sup>e</sup>, John Godwin<sup>f</sup>, Fred Gould<sup>g</sup>, Nick D. Holmes<sup>a</sup>, Gregg R. Howald<sup>a</sup>, Francine M. Madden<sup>h</sup>, Julia B. Ponder<sup>i</sup>, David W. Threadgill<sup>j,k</sup>, Alexander S. Wegmann<sup>a</sup>, Greg S. Baxter<sup>b</sup>

Innovation

# How Genetically Modified Mice Could One Day Save Island Birds

GBIRD

Genetic Biocontrol of  
Invasive Rodents



An aerial photograph of a coastline. The left side of the image shows deep blue ocean water with white foam from waves crashing against a dark, rocky shore. The right side of the image shows a large, dark brown, textured landmass, possibly a forested island or a large rock formation. The overall lighting is dim, giving the scene a moody, atmospheric quality.

# Mahalo Nui Noa

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