


Overview of Invasive Species




House Committee on Energy and Environmental Protection
&
Senate Committee Energy and Environment

Informational Briefing
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70 million or more years ago...

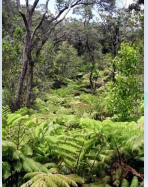
Plants and animals arrive & thrive



isolation
wide variety of habitats
millions of years
changes over time

+



20,000 native Hawaiian species




70 million years ago...

1500 years ago

First non-native (alien) species arrive = 34

...a few, like rats, proved to be invasive

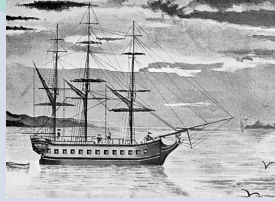




70 million years ago...

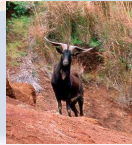
1500 years ago

232 years ago

More non-native (alien) species = 500?

...a few of these proved to be invasive, including goats and mosquitoes



70 million years ago...


1500 years ago

232 years ago

10 y/a

Today: More non-native species arrive (faster and in better living condition!)







- 343 new marine/brackish water species
- Hawaii went from 0 to 40 land reptiles
- 0 to 6 amphibians (including coqui)
- 20+ insects/year
- 10,000+ plant species introduced; 1,200 spread to natural areas; 200+ damaging ecosystems and natural resources

Are all aliens BAD???



No!

But we should be concerned about invasive species

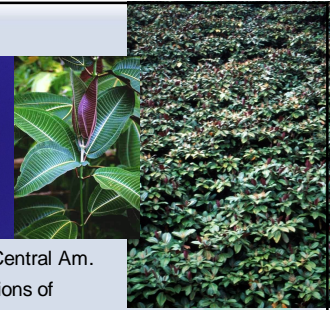
Invasive species are...

An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

(President Clinton Exec. Order 13112)



Example: *Miconia*



- 30-50 ft. tall tree native to Central Am.
- Each tree can produce millions of seeds/year
- Forms dense stands, outcompetes other plants & promotes runoff
- Introduced to Tahiti Nui in 1937, now nearly 70% of native forests overwhelmed, endangering 40+ species with extinction

Example: Strawberry guava



- Forms dense stands, outcompetes and replaces native plants
- Invading moist and wet forests on all islands, from sea level to 4000 ft. elevation
- Compared with native 'ōhi'a forests, strawberry guava-infested forests lose 27% more water, with the difference rising to 53% during dry periods.

Examples: Feral Pigs, Goats, Deer, Sheep



- Eat, trample and kill native plants, leaving the ground open to erosion or invasion
- Spread invasive plant seeds
- Pig wallows, dead tree ferns are breeding grounds for mosquitoes which spread diseases



What are the costs of invasive species?

Economic

- In the US, \$138 billion is spent/per year on a sample of alien plants and animals¹
- If introduced, Red Imported Fire Ants = \$211 million/year for HI²
- If introduced, Brown tree snakes = \$593 million-\$2 billion/year³
- Invasive seaweed can overgrow and kill Hawaii's nearshore reefs which generate \$800 million in revenues annually



¹Pimentel et al. 2000
²Gutrich et al. 2007
³Shwiff et al. 2010
⁴Cesar et al. 2002

What are the costs of invasive species?

Health and Quality of Life

- The arrival of a single mosquito carrying malaria or West Nile Virus would be devastating
- Biting sand flies can inflict 10,000 bites per person

MALARIA
**KILLS
 3000
 CHILDREN
 EVERYDAY**



What are the costs of invasive species?

Loss of Native Species

- Over 80% of endangered plants in Hawaii are threatened by invasive species¹
- Loss of culture & unique “sense of place”

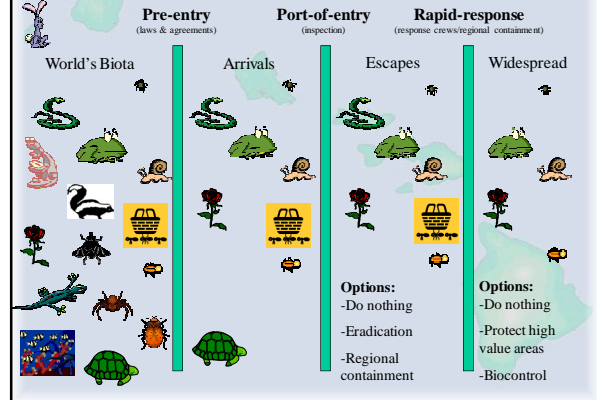
Loss of Ecosystem Services

- Less water in watershed (30-50%)²
- Reduced volume and reliability of freshwater flow associated with invasive trees³: potential for increased erosion and runoff
- Less pollinators = less food

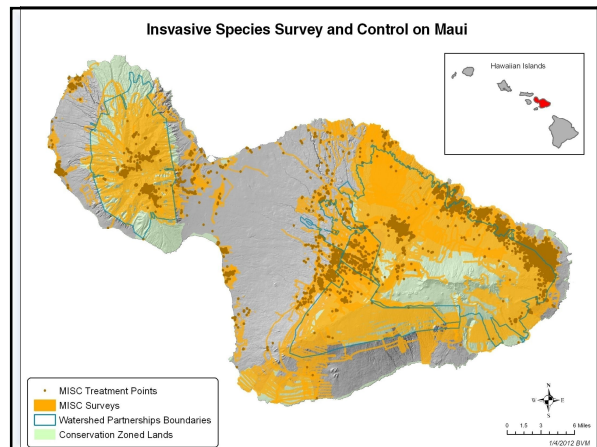
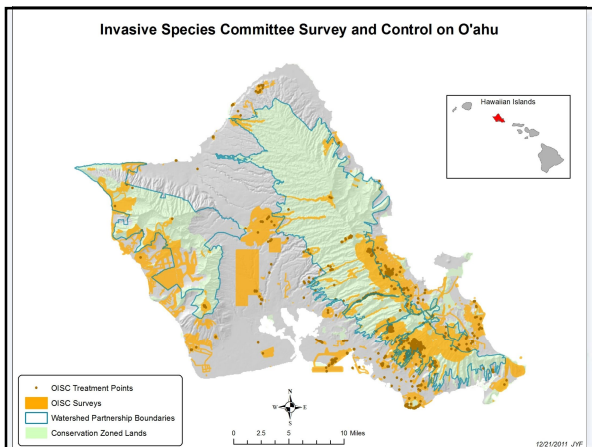
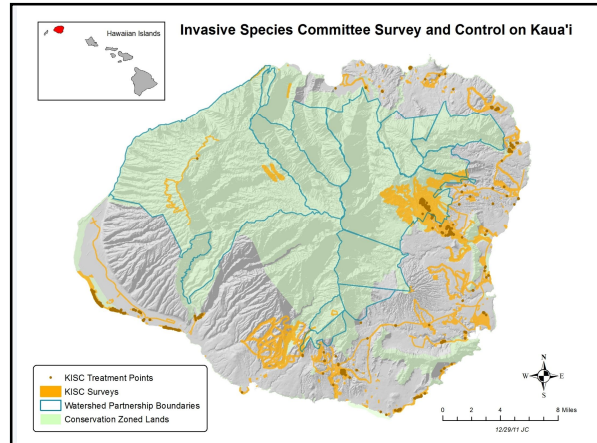


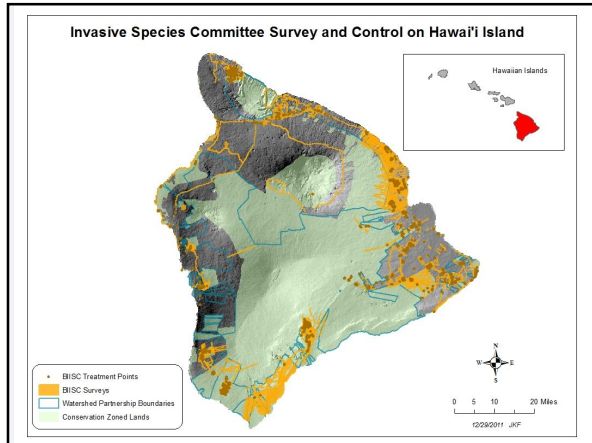
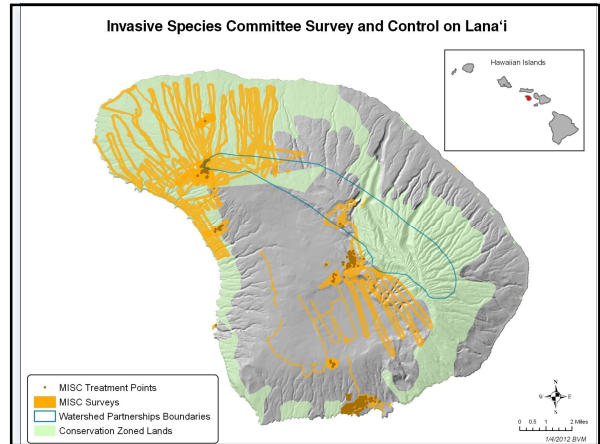
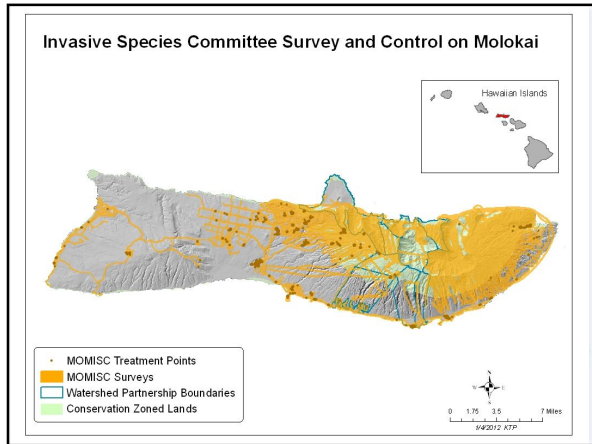
¹Wilcove et al., 1998
²Giambellucis et al. in press
³vanWigen et al., 1996

Protecting Hawai'i



The good news is that people care and are working to Protect Hawai'i. Your help and support is important!





HDOA Plant Pest Control

(Chemical, mechanical & biological control of pests)

Some biocontrol Successes

- Spiraling whitefly (1980)
- Woolly whitefly (1981)
- Vegetable leafminer (1975-1982)
- Diamondback moth (1983, 1985)
- Lesser cornstalk borer (1986)
- Blue coconut leaf beetle (1986)
- Miconia (1997)
- Ivy gourd (1996, 1998)
- Silverleaf whitefly (1998)
- Citrus blackfly (1999)
- Erythrina gall wasp (2008)
- Nettle caterpillar (2010)

Biocontrol: The meticulous science of reuniting invasive pests with their natural enemies.

DLNR/DAR Aquatic Invasive Species Team

(Prevention, response & control of aquatic invasives)

Moving forward

Mahalo for understanding the importance of the issue and the need to keep these programs running. Our top priority is to continue to raise the bar until the resources and legal tools are adequate for the job of protecting Hawai'i.

- We need dedicated and sustainable funding for each of these agency branches & NGOs
- We need ongoing help in making HDOA PQ's Biosecurity Program the best in the nation
- We need your support in preparing for the Guam build-up
- Because the majority of new pests arrive in produce, cut flowers, and plants, your support of local agriculture is also supremely important

Mahalo for your time today and for the opportunity to participate.