Hawaii's Interagency Biosecurity Strategy

Protecting What Matters in a Global Invasion Hotspot

Joshua Atwood, Ph.D.
Hawaii Invasive Species Council
Polynesian Introduction
Approx. 1500 y.a.
Approx. 34 spp.

Western Contact
Approx. 220 y.a.
Approx. 500 spp.

Today
Hawaii as a global
tourism & trade hub
10000 spp?
Global hotspots and correlates of alien species richness across taxonomic groups

Dawson et al. 2017, Ecology & Evolution, 1(186)
Number of federally listed threatened or endangered plant taxa by state

*data compiled from the US Fish and Wildlife Service website on 7/17/2014*
Number of federally listed threatened or endangered plant taxa by state

Hawaii: 415

*data compiled from the US Fish and Wildlife Service website on 7/17/2014*
Hawaii Invasive Species Council

[Logos of various state departments and agencies connected to the Hawaii Invasive Species Council]
Cabinet-level direction on invasive species prevention, control, research and outreach

**HISC COUNCIL**

- **DLNR**: Protection & management of natural resources
- **HDOA**: Document, prevent, & control agricultural pests.
- **DOH**: Human health, disease vector management, environmental quality
- **DBEDT**: State planning, economic impacts on tourism & other industries
- **DOT**: Manages airports, harbors & highways
- **UH**: Research and education related to invasive species

**HISC STAFF**

- HISC Support Program Administration: DLNR DOFAW Invasive Species Coordinator
- Other HISC Staff: Coordination, planning, and other duties required to carry out Council actions

**FUNDED PROJECTS**

- Projects that fill gaps between regular agency programs
  *e.g.: the ISCs, Hawaii Ant Lab, ad-hoc multi-agency responses*
- Projects that advance our collective knowledge about invasives
  *e.g.: Research on new ant baits, biological control development*
Key Partnerships

Invasive Species Committees

Hawai‘i Ant Lab

CGAPS
Key Partnerships

- Interagency decision making committee focused on filling a specific gap
- Project is administered by UH Pacific Cooperative Studies Unit
- Dedicated staff through Research Corporation of the University of Hawaii
- Soft funded by HISC and a mix of other state, fed, county, private funds
Current Threats & Response

Little Fire Ant (*Wasmannia auropunctata*)
Current Threats & Response

Little Fire Ant (*Wasmannia auropunctata*)

- Distribution
Current Threats & Response

Little Fire Ant (*Wasmannia auropunctata*)

• Impacts

$174,000,000/yr in damages & management costs

Motoki et al, 2013
Current Threats & Response

Little Fire Ant (Wasmannia auropunctata)

Response
- Hawaii Island: Community training & empowerment
- Maui: Partnership with Maui ISC and HDOA
- Oahu: 2014 Incident Command System led by HDOA
- Kauai: Partnership with HDOA and Kauai ISC
- Statewide outreach by HAL, ISCs, CGAPS

www.littlefireants.com
Stop the spread of Little Fire Ants in Hawaii

Image of a group of people and a statue of an ant.
Current Threats & Response

Miconia (*Miconia calvescens*)
Current Threats & Response

Miconia (*Miconia calvescens*)
• Distribution
Current Threats & Response

Miconia (*Miconia calvescens*)

Impacts:
- Competition
- Monotypic stands
- Increase in rain drop velocity
- Increase in erosion potential

$672\text{M/yr}$ in lost water recharge and bird habitat
(Burnett et al., 2007)
Current Threats & Response

Miconia (*Miconia calvescens*)

Response:
- Invasive Species Committees: ground and aerial detection & control
- Dr. James Leary, UH: Herbicide Ballistic Technology
- Drs. Tracy Johnson and Ken Puliafico, USFS: biological control

*Hawaii Tribune Herald*

Miconia wins: Experts concede Hawaii Island has lost the war against invasive plant

Published May 1, 2017 - 12:00am
Current Threats & Response

Mosquitoes (*Aedes* spp., *Culex quinquefaciatus*)
- Distribution
Current Threats & Response

Mosquitoes (*Aedes* spp., *Culex quinquefasciatus*)

• Impacts
Current Threats & Response

Mosquitoes (*Aedes* spp., *Culex quinquefasciatus*)

Response:
- Restoration of Dept of Health’s Vector Control Branch
- Avian Malaria Working Group
- State Mosquito Working Group
- HISC resolution supporting development of landscape-scale control techniques
Current Threats & Response

Rapid Ohia Death (*Ceratocystis spp*)
Current Threats & Response

Rapid Ohia Death (*Ceratocystis spp*)
• Distribution
Current Threats & Response

Rapid Ohia Death (*Ceratocystis spp*)
- Impacts
Current Threats & Response

Rapid Ohia Death (*Ceratocystis spp*)

Response:
- HDOA quarantine on ohia products
- Multi-agency advisory group formed to direct management (RODAG)
- RODAG recognized by HISC as coordinating body, consulted for funding
- Research directed by USDA ARS, USFS, and UH
- Aerial mapping and ground response by Big Island ISC, Hawaii DLNR, Watershed Partnerships, and others
Current Threats & Response

Coconut Rhinoceros Beetle (*Oryctes rhinoceros*)
- Distribution
Current Threats & Response

Coconut Rhinoceros Beetle (*Oryctes rhinoceros*)
- Impacts
Current Threats & Response

Coconut Rhinoceros Beetle (*Oryctes rhinoceros*)

- **Response**

![Image of Coconut Rhinoceros Beetle]

- RESEARCH: Research is still underway to better understand the cyclic nature of weekly, monthly, and annual trap capture rates.

- OUTREACH: 10 public interactions by field crew during this reporting period. 20 public reports addressed during this reporting period. 14 businesses interacted by field crew during this reporting period. Presentations made at various facilities, including: HPCPB Insect Control, Waialua panoramic view, Kahuku residents updates, and Haena Beach Residents (1).

- MITIGATION: 1,000 trap services conducted on 3,000 total traps during this reporting period.

![Map of Coconut Rhinoceros Beetle distribution]

- BEETLE FACT: The CRB Response Program records a variety of types of CRB trap captures, including: general traps and pan traps, but not including experimental traps. Captures reported by the public, larval finds in community CRB found in dead trees or stumps.

- AREAS OF DETECTION: 2 Mile Buffer of Trap Detection.

![Group photo of individuals involved in response efforts]
### Known Gaps:

<table>
<thead>
<tr>
<th>INFORMATIONAL</th>
<th>STAFF</th>
<th>FACILITIES</th>
<th>POLICY</th>
<th>FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import database</td>
<td>Fewer staff now than in 2008 at multiple agencies</td>
<td>Inspection facilities</td>
<td>Ballast and biofouling</td>
<td>Soft funds</td>
</tr>
<tr>
<td>Risk assessments</td>
<td></td>
<td>Biocontrol lab</td>
<td>Non-ag commodities</td>
<td>Shrinking fed grants</td>
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<td>1.4% of budget to DLNR and HDOA</td>
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- Biosecurity *programs*, no *plan*
- "Piecemeal" legislation
The Hawaii Interagency Biosecurity Plan 2017-2027

❖ Comprehensive in scope

❖ Multidisciplinary, collaborative approach

❖ 150 action items to address gaps and weakness in our biosecurity system

❖ A 10-year path forward
The HIBP: Actions

<table>
<thead>
<tr>
<th>Task</th>
<th>Implementation Detail</th>
<th>Time</th>
<th>Lead Agency</th>
<th>Partnering Org</th>
<th>Budget and Implementation Detail</th>
<th>10 Year Total</th>
<th>FY2018-FY2019</th>
<th>FY2020-FY2021</th>
<th>FY2022-FY2023</th>
<th>FY2024-FY2025</th>
<th>FY2026-FY2027</th>
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<tr>
<td>PreTifs 2.2</td>
<td>Hire three entomologist, two plant pathologists, and one botanist to conduct risk analysis on organisms, commodities, and pathways entering Hawai‘i.</td>
<td>2020-2027</td>
<td>HDOA</td>
<td>DLNR UH</td>
<td>Add 6 new positions incrementally as program responsibilities expand. Add 2 new positions in FY2020-2021, add 2 more in FY2022-2023 (4 positions), and add the final 2 positions in FY2024-2025</td>
<td>$1.98M</td>
<td>$220k</td>
<td>$440k</td>
<td>$660k</td>
<td>$660k</td>
<td>$660k</td>
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Biosecurity in 2027

- Agricultural Loan Program
- Risk assessments and electronic manifesting
- Regulation of ballast and biofouling
- Inspection facilities
- Doubled inspection staff, for both imports and interisland shipments
- Field capacity at DLNR & DOH
Biosecurity in 2027

- Stable funding for the ISCs
- HDOA biocontrol facility
- New statewide and local outreach tools, including 643pest.org
- Hawaii Invasive Species Authority
Hawaii Invasive Species Authority

• HISA would be an external agency with dedicated staff
• New board seats: Cultural Practitioner, Ag Industry, Conservation NGO
• HIBP Responsibility
• Enhanced policy, outreach, and data functions
Costs in Context

$378,000,000
10-year cost of all HIBP actions

0.3%
Additional portion of the state budget required to achieve all actions
Costs in Context

- Brown Tree Snake: $2.14B
- Miconia: $672M
- Red Imported Fire Ant: $200M
- Little Fire Ant (HI County only): $174M
- Addtl HIBP costs: $38M

Estimated annual damages/cost (Millions of dollars)
Costs in Context

$600 million agriculture industry

$14.9 billion tourism industry

Trillions in Natural Capital
The Koolau Mountain forest watershed alone is estimated at $14 billion in economic and ecosystem services.

Our way of life in the islands ...
Outcomes

- Annual legislative package
- Working Group Directions
- HIBP tracking by HISC/HISA
- Governor’s dashboard
- Annual report card
- Annual Conference Update
Political Support

- Aloha+ Challenge
- Sustainable Hawaii Initiative
- Legislative education (human or otherwise)
Questions?

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