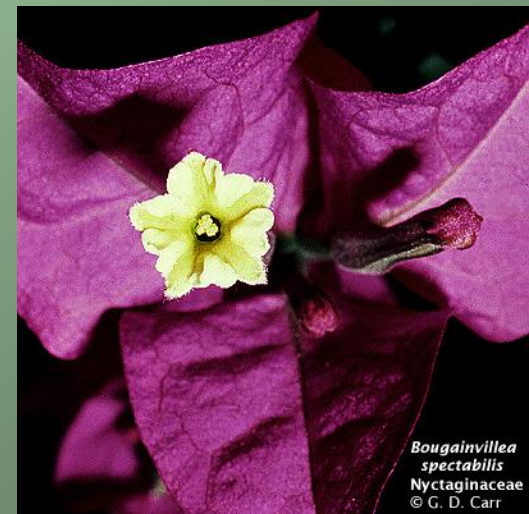


Hawaii-Pacific Weed Risk Assessment

Hawaii Invasive Species Council
May 2012 Update

Chuck Chimera & Patti Clifford
Weed Risk Assessment Specialists

Alien species: plants or animals that were brought to a place by humans or through human activity.



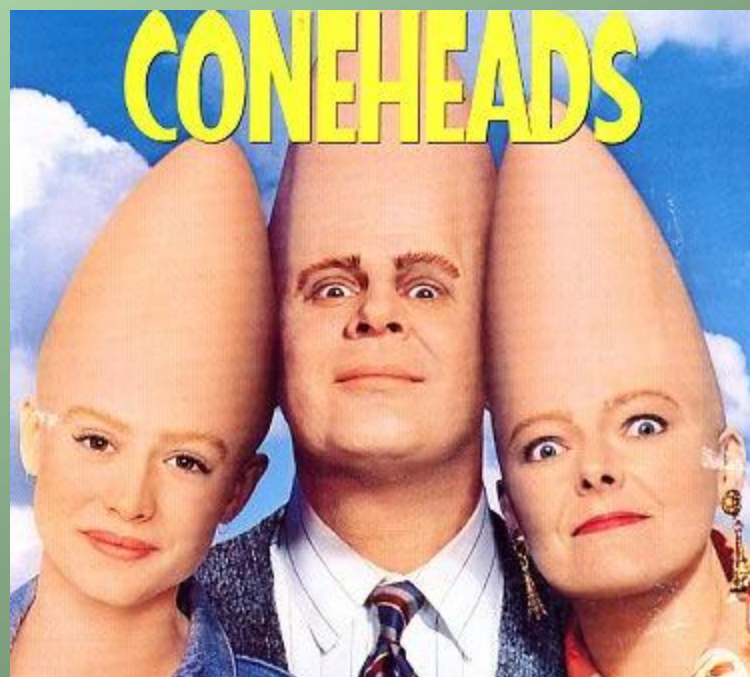
Are all aliens bad?



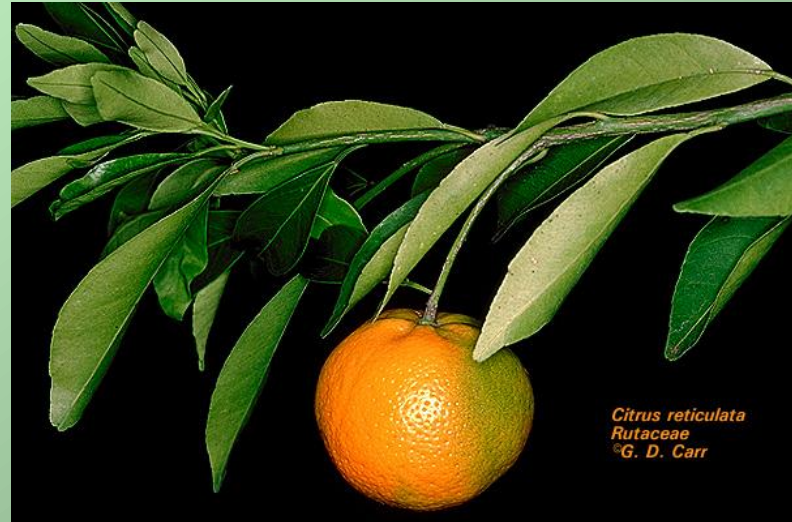


Are all aliens bad?

No!



Not all alien species are 'bad'.



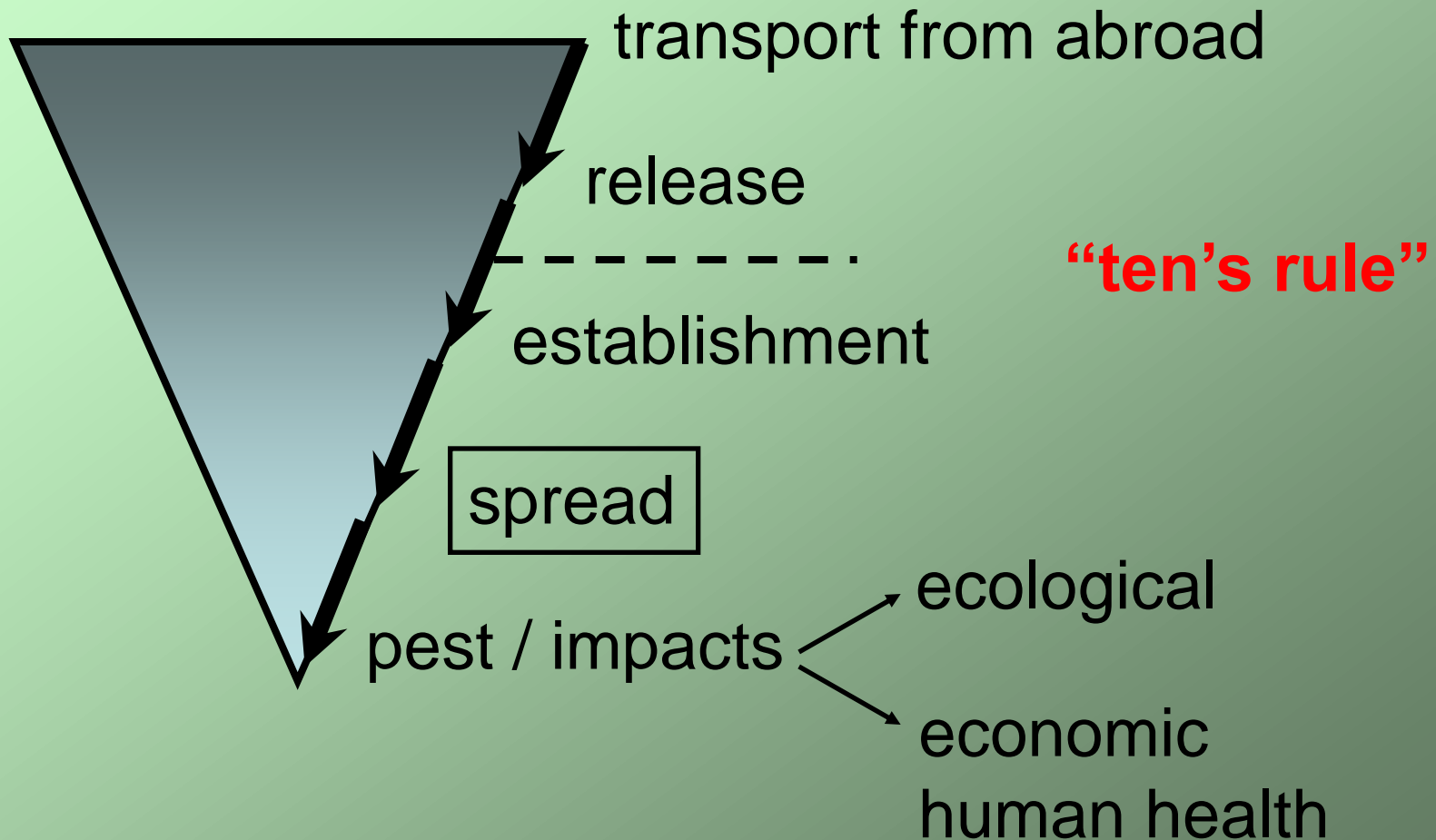
...but we should be concerned if the alien species are **INVASIVE**.

Invasive species: alien plants or animals that don't stay put; they reproduce quickly, spread easily, take over and cause harm

Invasive = pest = nuisance species

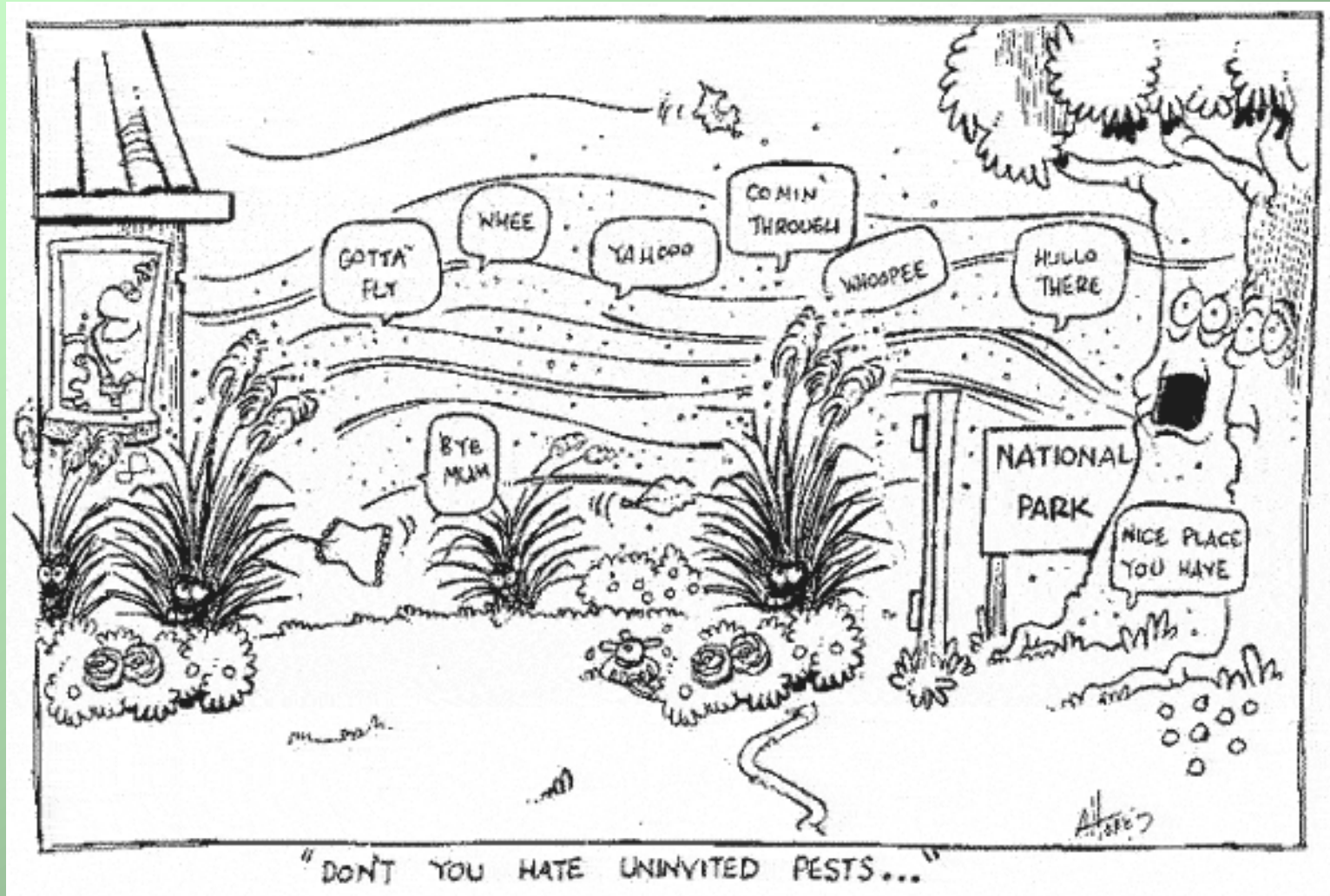


Invasion Process



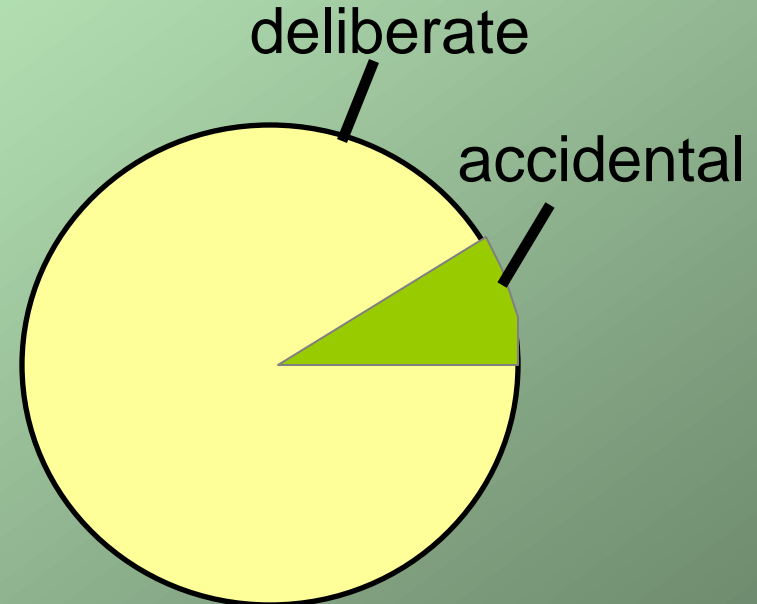
Plant invasion pathways and problem

Many of the plants that are now invading the forests started as ornamentals in yards and gardens.



Plant invasion pathways and problems

- Federal noxious weed list
 - temperate species
 - 104 spp. or varieties
- Hawaii noxious weed list
 - mainly crop weeds
 - accidental introductions
 - 95 spp. or varieties
- > 8000 introduced plants
 - New species each year



Invasive species
of natural areas

Smith 1985

**It is LEGAL to
import into Hawaii
>99% of
the plants that
exist on Earth,
no questions
asked.**



Getting Ahead of the Problem

1. Assessing the potential for a plant species to be invasive in Hawaii PRIOR to introduction.
2. Identifying and promoting non-invasive plants should be a priority.
3. The people working in the forest and the people working in the ornamental plant industry need to work together to educate each other and the PUBLIC.

Getting Ahead of the Problem

A Weed Risk Assessment (WRA) System is a proactive tool used to identify plants that pose a high risk of causing ecological or economic harm.



Developing the WRA system for Hawai'i

- Several systems were examined for use in Hawai'i
- The Australian AQIS system was most promising after simple modifications¹

History of the Australian WRA system

1994 Developed & tested in Australia

1995 Modified & tested in New Zealand
(currently used in both countries)

1998 Modified & tested for use in Hawai'i

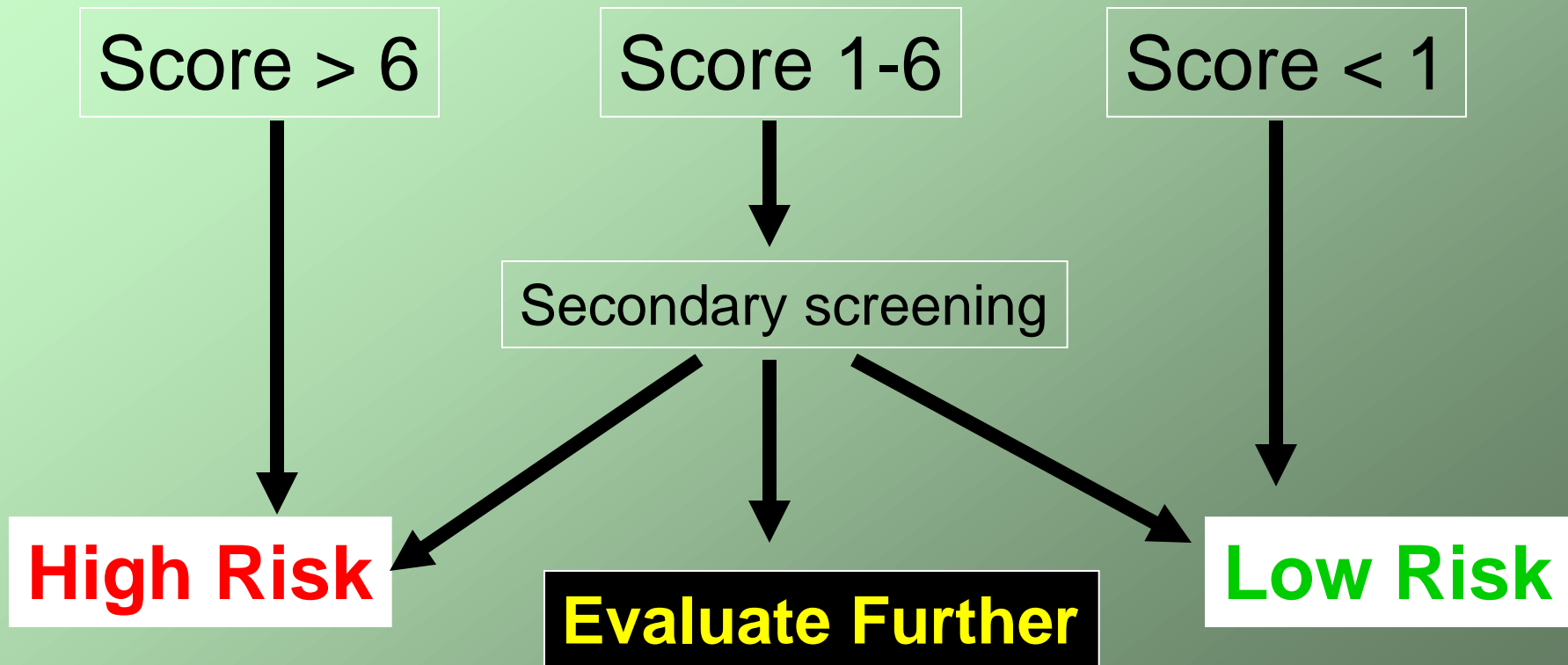
2001-2002 Further testing for use in Hawai'i
& other Pacific Islands

2002-present Voluntary compliance in Hawai'i

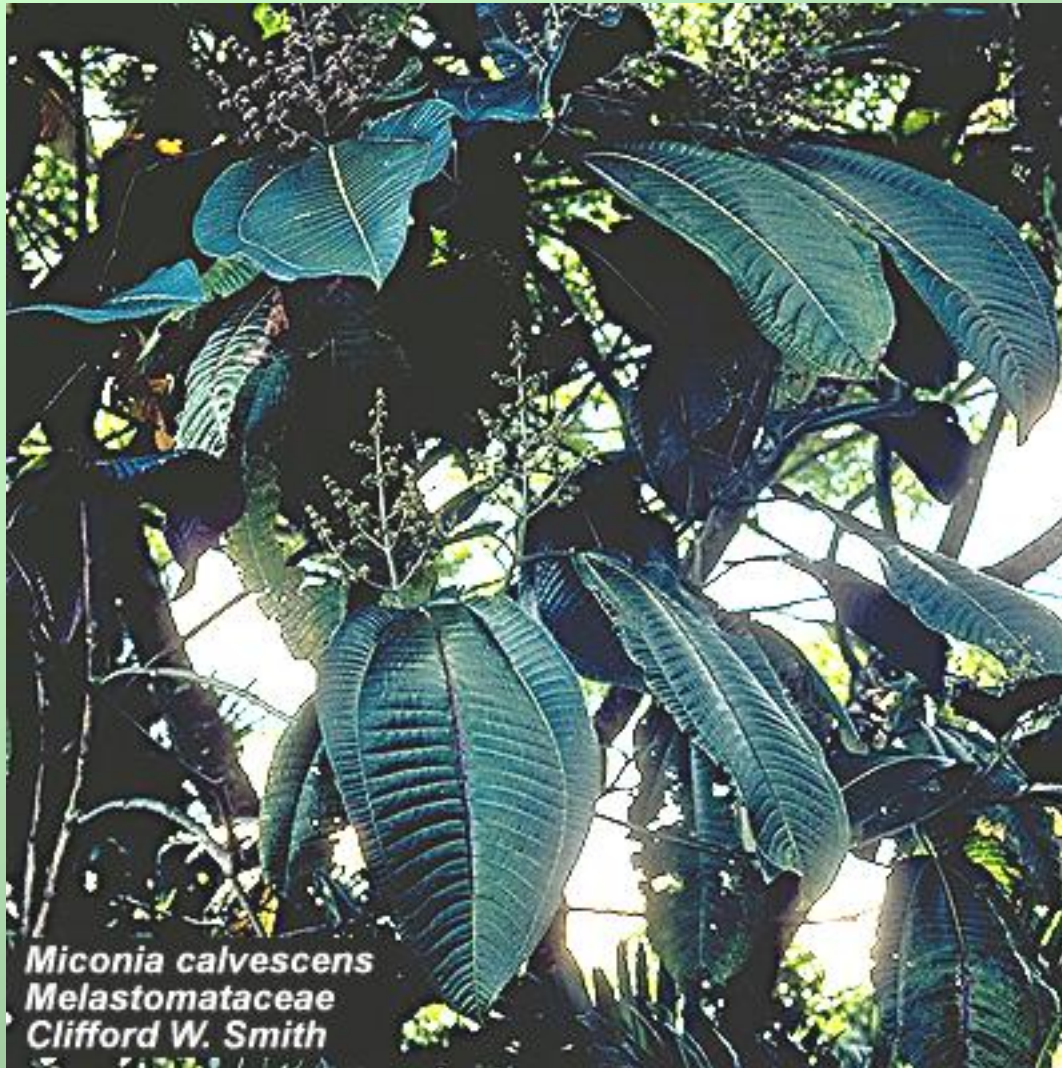
¹Daehler and Carino 2000

Hawai'i Weed Risk Assessment

Assign species score based on 49 questions



Example: WRA for *Miconia calvenscens*



Score: 14

Decision: PEST

Risk factors

- Environmental weed of Tahiti
- Broad range (0-6000 ft elevation)
- Shade-tolerance
- Re-growth after mutilation

Example: WRA for *Miconia calvescens*



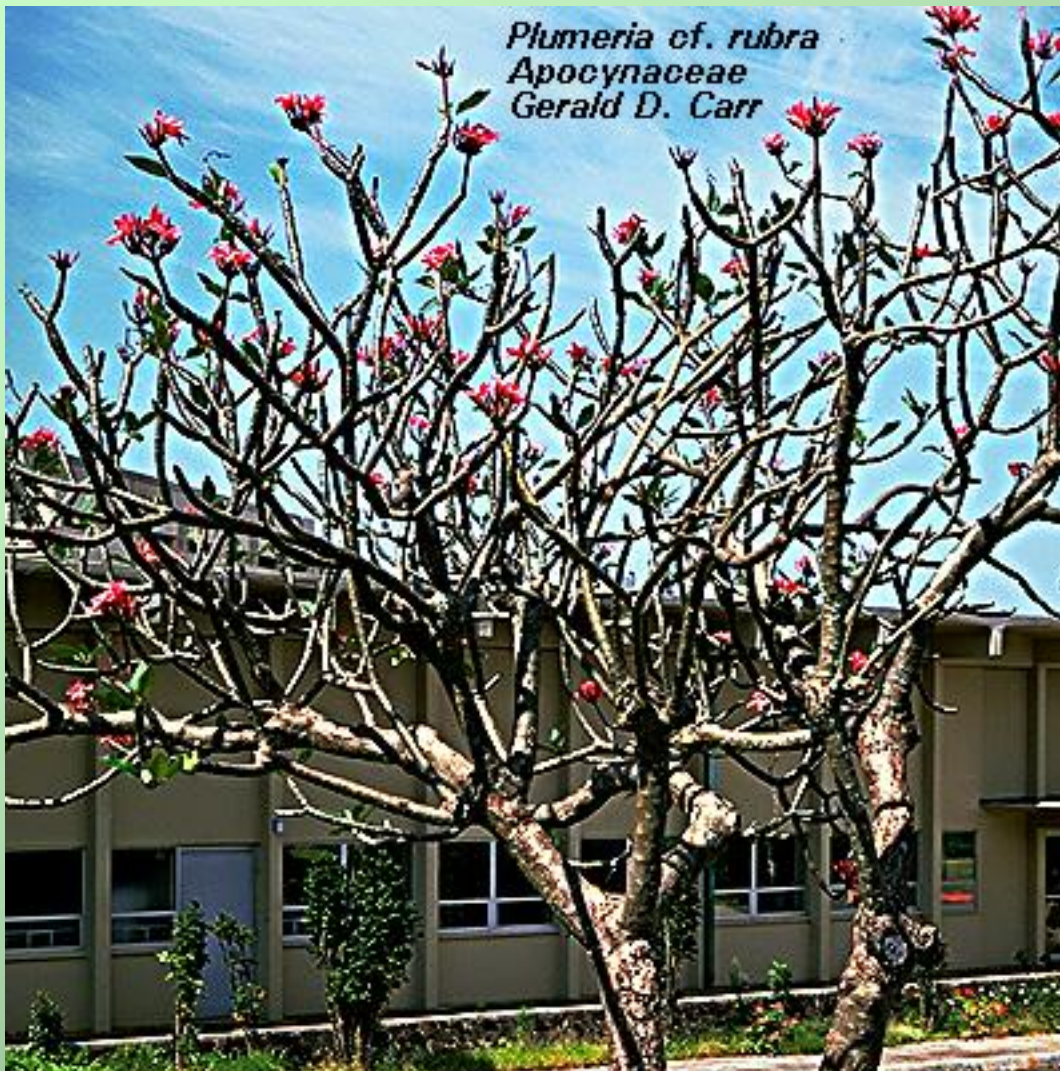
Score: 14

Decision: PEST

Risk factors

- Self-compatible
- > 1000 seeds/m²
- Bird-dispersed
- Easy accidental dispersal by humans

Example WRA for *Plumeria rubra* (frangipani)



WRA Score: -5

Decision: NOT A PEST

Risk factors

- toxic/allergenic sap
- tolerates a wide range of soil conditions

Example WRA for *Plumeria rubra* (frangipani)



Photo by Forest & Kim Starr

WRA Score: -5

Decision: NOT A PEST

Risk-reducing factors

- not a recognized pest elsewhere
- poor shade tolerance
- does not form dense thickets
- specialist pollinator
- lacking natural vegetative spread

Uses of the WRA system in Hawai'i

Species not yet in Hawai'i

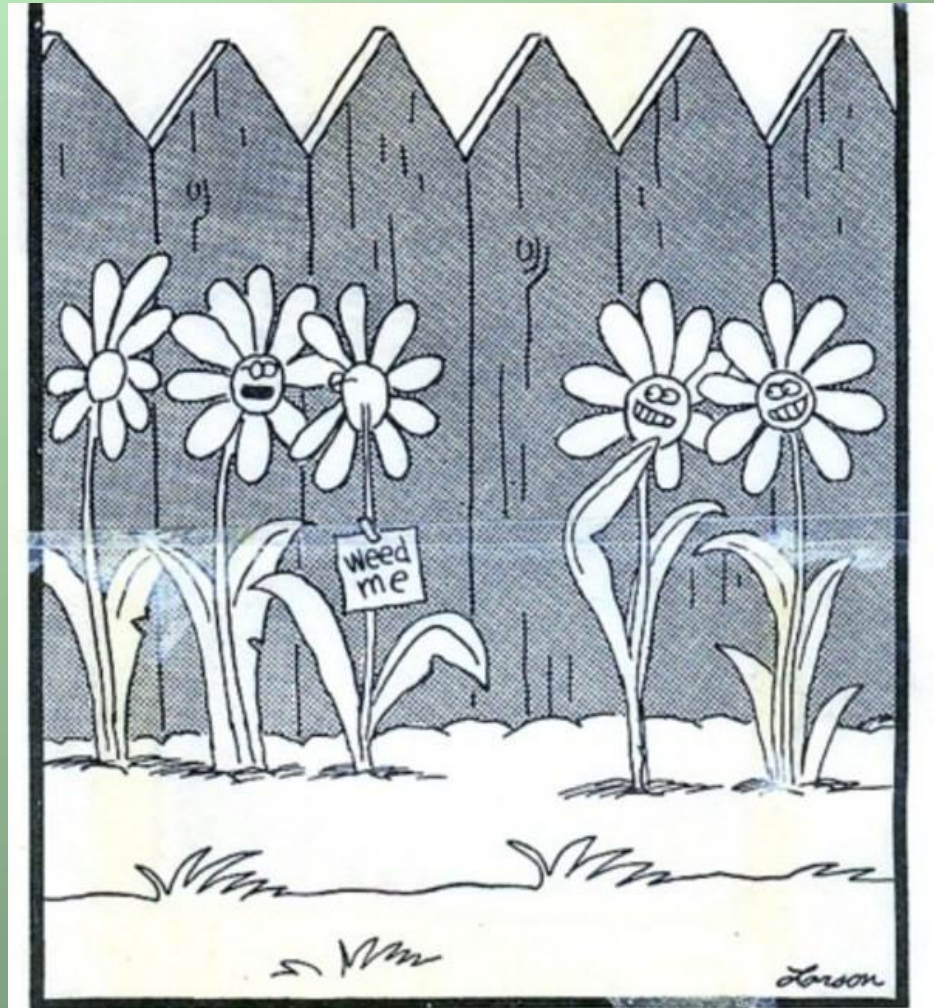
- assist with importation decisions

Species already in Hawai'i

- allow informed planting decisions for nursery growers, architects, landscapers, foresters, land managers, ranchers, public

Characteristics of the Hawaii Pacific Weed Risk Assessment (HPWRA) System

- Objective
- Science-based
- Repeatable
- Transparent
- Reliable



Flora Practical Jokes

WRA Highlights: May 2011 - May 2012

- 1278 species screened (79 in 2012)
 - 528 High Risk (41.3%)
 - 593 Low Risk (46.4%)
 - 157 Evaluate (12.3%)
- Information used by government, public, industry & conservation groups statewide & internationally



Landscaping / Horticultural Industry



College of Tropical Agriculture
and Human Resources
University of Hawaii at Manoa

Ornamentals and Flowers
Feb. 2010
OF-46

Non-invasive Landscape Plants with Fragrant Flowers

Patti Clifford¹ and Kent Kobayashi²

¹Hawaii Invasive Species Council, ²CTAHR Department of Tropical Plant and Soil Sciences

Weeds are not friends to my garden. They cause more work and displace the flowers or vegetables that I am trying to grow. But I do understand that in our multicultural world, a weed to one person may be a medicine, food, or ornamental to another. Plants have many uses to humans; that is why we transport them with us as we traverse the planet.

In Hawaii's, many of the native plants are endemic—they are not found anywhere else in the world. This rarity has made them vulnerable to impacts from non-native species. Some of the plants introduced here from other regions become weeds and displace the native plants. While invasive weeds may cause trouble in my garden, they create havoc in Hawaii's delicate native ecosystems.

Hawaii's natural ecosystems have one of the worst weed problems in the world. To help understand and cope with this problem, scientists developed a system, the Hawaii-Pacific Weed Risk Assessment (HPWRA), which can predict a plant's ability to become a weed here. This system is based on the plant's biological and ecological characteristics (its natural history, performance in its native environment, and behavior in other parts of the world). By considering the information the system has assembled, we can predict how the decision to plant a particular plant may affect the native Hawaiian environment.

Preventing invasive species from becoming established in Hawaii is the most economically and environmentally efficient method of dealing with unwanted weeds. The plants in this publication have been screened by the HPWRA. They are considered to be of low risk for invasiveness to Hawaii's agricultural systems and native environments. For more information on the HPWRA, visit www.hear.org/wra.

To have a plant screened by one of the Hawaii Invasive Species Council's weed risk assessment specialists, e-mail hpwra@yahoo.com.

Characteristics of invasive plants

Many of the attributes that we appreciate in our garden and landscape plants contribute to their ability to invade natural and agricultural ecosystems. These include

- rapid growth
- early maturity
- heavy seed production
- vegetative reproduction (i.e., pieces of roots, stems, or leaves can break off and grow into new plants; this can happen when green waste or plant trimmings are discarded)
- tolerance of dense shade (confering ability to spread into the understory of native forests)
- having non-specific pollinators
- having a "seed bank" (i.e., seeds last for a long time in the soil and may germinate many years later, or they can accidentally be moved around with the soil).

How to use this resource

This document gives a brief outline of the characteristics of seven plant species with fragrant flowers. Because of their low risk of invasiveness, they are suitable for planting in Hawaii's landscapes. Resources for in-depth information on plant care are included in the references section. The HPWRA is a predictive tool based on current knowledge about a plant species. The system correctly classifies 80–85% of non-pest (low-risk) species. If one of the species described in this publication starts to exhibit invasive characteristics, please contact hpwra@hear.org.

Published by the College of Tropical Agriculture and Human Resources (CTAHR) and issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Andrew G. Hoshimoto, Director/Dean, Cooperative Extension Service/CTAHR, University of Hawaii at Manoa, Honolulu, Hawaii 96822. An equal opportunity/affirmative action and nondiscrimination program and service to the people of Hawaii is provided regardless of race, sex, age, religion, color, national origin, ancestry, disability, marital status, arrest and court records, sexual orientation, or status as a covered veteran. CTAHR publications can be found on the Web site <http://www.ctahr.hawaii.edu/threepub>.

CTAHR Feb 2010 (new article forthcoming)

KEEPING INVASIVE SPECIES OUT OF KAUAI

BY TIFFANI KEANINI

The Kaua'i Landscape Industry Council (KLIC) has recently made a bold statement with an updated Codes of Conduct for their industry. These Codes of Conduct are based on ones developed by the Missouri Botanical Garden and the Nature Conservancy focused on self-regulation to fight against invasive species and to protect the unique ecosystems that Kaua'i has.

KLIC first adopted the Codes of Conduct in 2006, which resulted in a lot of attention being drawn to the invasive Australian tree fern (*Sphaeropteris cooperi*). After signing the codes, Lelan Nishek, owner of Kaua'i Nursery and Landscaping, destroyed their entire inventory valued at more than \$8,000 after being shown how destructive this plant can be to Kaua'i's watersheds.

The motivation behind these updated codes was to incorporate not only Best Management Practices of preventing accidental introductions of unwanted pests like Coqui frog and Little Fire Ant, but to also help the community by offering plants that are scientifically evaluated as having a low risk of being invasive in this subtropical environment.

The tool that aids in this scientific evaluation of plant-invasiveness is the Hawaii Pacific Weed Risk Assessment (HP-WRA), a research project from the University of Hawai'i. The intent of the HP-WRA is to identify plants that pose a high weed risk in Hawai'i and other Pacific Islands. "This tool has proven invaluable for evaluating new landscaping plants before introducing them," Nishek commented. "The great thing about it is that anyone can submit plants for evaluation or check the website for plants they are considering planting to see how invasive they might be."



Medinilla cumingii (Showy Medinilla)

The new codes adopted by KLIC state that "KLIC will agree to discontinue the ordering, growing, selling, and promoting of any plant currently listed on the Hawai'i State Noxious Weed list. KLIC will support additions to the Noxious Weed list and rule-making associated with scientifically based updates. KLIC will also agree to avoid using, selling, or importing any plants deemed "High Risk" on the Hawai'i Pacific Weed Risk Assessment."

"This is an important step in helping to educate the public about invasive plants and what they can do to the environment," stated Lelan Nishek, who is also the current President of KLIC. "We want to lead by example and the best way to do that is to use plants in landscaping that are not going to destroy our watersheds and take over everything."

Other KLIC members echoed Nishek's sentiment. Lee Ridley, Marriott's Waiohai Beach Club Grounds Manager, said, "When choosing landscaping plants you sometimes want to use something that will be easy and fast to grow, but this can lead to problems later. All of the sudden what you planted has overtaken everything else and has become a maintenance nightmare. Making scientifically informed choices will make everyone's job easier."

KLIC worked in collaboration with Tiffani Keanini, Outreach Specialist, and Keren Gundersen, Project Manager, with the Kaua'i Invasive Species Committee

(KISC). KISC works island-wide on targeted plants, animals, and insects to keep them from spreading beyond control. Education and outreach are important tools that KISC uses to increase their "eyes and ears" for reporting new species across the island.

"It is so important that these leaders in the green industry not only do what is pono, but educate the public while they are doing it," stated Gundersen. "We are so grateful to be getting support from such an important industry because invasive plants often escape from yards and gardens, causing huge economic and ecological damage to our watersheds."

KLIC is the first landscaping association in Hawai'i to review and update their codes. This move makes a bold statement as to not only what plants they will promote, but also how they will prevent unwanted pests from harming Kaua'i's ecosystems, forests, and the health and welfare of the community as a whole.

For information on the Hawaii Pacific Weed Risk Assessment see: <https://sites.google.com/site/weedriskassessment/>.

Tiffani Keanini is the Outreach Specialist for the Kaua'i Invasive Species Committee. For more information on the voluntary Codes of Conduct or to learn more about invasive species, contact Keanini at tkeanini@hawaii.edu.

- "This tool has proven invaluable for evaluating new landscaping plants before introducing them."
- "The great thing about it is that anyone can submit plants for evaluation or check the website for plants they are considering before planting to see how invasive they might be."

– Lelan Nishek, owner, Kauai Nursery and Landscaping quoted in Hawaii Landscape, April-May 2012 Issue

First Wind: Kaheawa Wind project



Non-invasive planting recommendations for revegetation projects

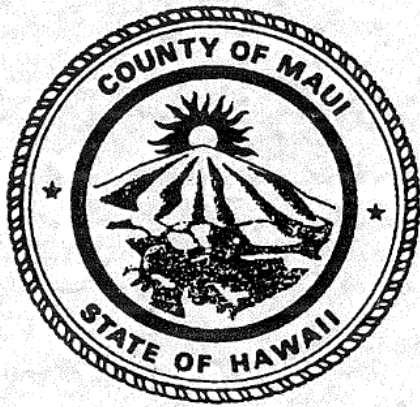
General Public

- Recent assessments for Miracle berry & others



County Government

MAUI COUNTY PLANTING PLAN



Mountain rose = -5 (Low Risk)



Ashoka Tree = 0 (Low Risk)



Ashoka Tree = 0 (Low Risk)

State Government

- IHOP Promotion
- Local Christmas Tree Industry



Invasive Species Committees

- Early detection
- Target species prioritization



MISC Species Assessments Maui Early Detection

<u>Species</u>	<u>Rank</u>	<u>Total</u>	<u>Invasive</u>	<u>Control</u>
<i>Nassella tenuissima</i>	1	125.5	30.5	95
<i>Pennisetum villosum</i>	2	123.5	28.5	95
<i>Cestrum elegans</i>	3	122	22	100
<i>Linaria dalmatica</i>	4	121	21	100
<i>Gutierrezia sarothrae</i>	5	121	21	100
<i>Cestrum aurantiacum</i>	6	118	18	100
<i>Dalbergia sissoo</i>	7	117.5	17.5	100
<i>Typha latifolia</i>	8	116	31	85
<i>Silybum marianum</i>	9	113	23	90
<i>Pennisetum setaceum</i>	10	112	32	80
<i>Torilis arvensis</i>	11	111.5	11.5	100
<i>Elaeis guineensis</i>	12	110.5	10.5	100
<i>Vitex parviflora</i>	13	110.5	10.5	100
<i>Agonis flexuosa</i>	14	110.5	10.5	100
<i>Allophylus cobbe</i>	15	110	10	100
<i>Hakea salicifolia</i>	16	110	15	95
<i>Roldana petasitis</i>	17	109.5	14.5	95
<i>Cissus nodosa</i>	18	109	9	100
<i>Rubus ellipticus</i>	19	109	24	85
<i>Rivina humilis</i>	20	108	13	95
<i>Hamelia patens</i>	21	108	8	100
<i>Senna artemisioides</i>	22	108	13	95
<i>Hypericum perforatum</i>	23	107	17	90
<i>Erica lusitanica</i>	24	106.5	26.5	80
<i>Senna spectabilis</i>	25	105.5	15.5	90
<i>Terminalia ivorensis</i>	26	105	10	95
<i>Cissus rotundifolia</i>	27	105	10	95
<i>Tamarix aphylla</i>	28	104	19	85

Federal Gov't: NRCS

- New *Leucaena* cultivars for cattle fodder
 - “I greatly appreciate the information, it's very timely that the two hybrids were recently run. Your response will be good guidance for our agency in general, as well as this specific project.”
 - Mike Constantinides - NRCS, Honolulu
 - “Thanks much for the thorough and fair weed risk assessments for *Leucaena* KX2 and *Leucaena* ‘Wondergraze’. Your explanation and the full risk assessments are very helpful. I realize everyone is busy and I appreciate the fact that you were able to do this so quickly.”
 - Robert Joy – NRCS, Honolulu

Biofuels Assessments

OPEN ACCESS Freely available online



Assessing Biofuel Crop Invasiveness: A Case Study

Christopher Evan Buddenhagen*, Charles Chimera, Patti Clifford

Pacific Cooperative Studies Unit, University of Hawaii at Manoa, Honolulu, Hawaii, United States of America

Abstract

Background: There is widespread interest in biofuel crops as a solution to the world's energy needs, particularly in light of concerns over greenhouse-gas emissions. Despite reservations about their adverse environmental impacts, no attempt has been made to quantify actual, relative or potential invasiveness of terrestrial biofuel crops at an appropriate regional or international scale, and their planting continues to be largely unregulated.

Methodology/Principal Findings: Using a widely accepted weed risk assessment system, we analyzed a comprehensive list of regionally suitable biofuel crops to show that seventy percent have a high risk of becoming invasive versus one-quarter of non-biofuel plant species and are two to four times more likely to establish wild populations locally or be invasive in Hawaii or in other locations with a similar climate.

Conclusions/Significance: Because of climatic and ecological similarities, predictions of biofuel crop invasiveness in Hawaii are applicable to other vulnerable island and subtropical ecosystems worldwide. We demonstrate the utility of an accessible and scientifically proven risk assessment protocol that allows users to predict if introduced species will become invasive in their region of interest. Other evidence supports the contention that propagule pressure created by extensive plantings will exacerbate invasions, a scenario expected with large-scale biofuel crop cultivation. Proactive measures, such as risk assessments, should be employed to predict invasion risks, which could then be mitigated via implementation of appropriate planting policies and adoption of the "polluter-pays" principle.

Citation: Buddenhagen CE, Chimera C, Clifford P (2009) Assessing Biofuel Crop Invasiveness: A Case Study. PLoS ONE 4(4): e5261. doi:10.1371/journal.pone.0052611

Editor: Dennis Marquis Hansen, Stanford University, United States of America

Received: February 20, 2009; **Accepted:** March 19, 2009; **Published:** April 22, 2009

Copyright: © 2009 Buddenhagen et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Funding: The Hawaii Invasive Species Council provided funds through the Hawaii Department of Land and Natural Resources to carry out weed risk assessments for introduced species. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

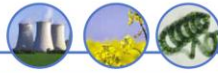
Competing Interests: The authors have declared that no competing interests exist.

* E-mail: cbuddenhagen@gmail.com

PLOS One Vol. 4(4): April 2009

Biofuels: the risks and dangers of introducing invasive species

Biofuels (2010) 1(5), 785–796



Charles G Chimera¹*, Christopher E Buddenhagen² & Patti M Clifford^{1,3}

Biofuel crops are increasingly promoted as environmental and economical solutions to global energy needs, but actual benefits versus costs may be less favorable than advocates claim. Among the risks associated with their cultivation is the potential to exacerbate the invasive species problem. Evidence is growing that many proposed biofuel crops are ideally suited to become successful invaders. We compared actual and candidate terrestrial biofuel crops suitable for temperate and tropical climates with introduced, nonbiofuel species, and demonstrated that biofuel species are almost three-times more likely to naturalize and over twice as likely to be invasive as nonbiofuel crops in both climatic conditions. Similar potential may exist for algae biofuels. The risks could be mitigated, and unintended environmental costs avoided, by implementing precautions including assessing and removing the worst invaders from consideration, selecting lower risk species for widespread cultivation, and actively controlling the spread of crops from cultivated areas.

Assessing Biofuel Crop Invasiveness For Hawaii: A Comprehensive Case Study

Christopher Buddenhagen, Charles Chimera and Patti Clifford

Background: There is widespread interest in biofuel crops as a solution to the world's energy needs, particularly in light of concerns over greenhouse-gas emissions. Despite reservations about their adverse environmental impacts, no previous attempt has been made to quantify actual, relative or potential invasiveness of terrestrial biofuel crops at an appropriate regional or international scale, and their planting continues to be largely unregulated.

Methodology/Principal Findings: Using the Hawaii-Pacific Weed Risk Assessment (HPWRA) system, we analyzed a comprehensive list of 40 regionally suitable biofuel crops (see images) to show that 70% have a high risk of becoming invasive versus one quarter of non-biofuel plant species (Table & Figure 1) and are two to four times more likely to establish wild populations locally or be invasive in Hawaii or in other locations with a similar climate (Table 2).

Table 1. Numbers (percentages) of species falling into the WRA risk categories within a group of species proposed as biofuels and a random selection of introduced species in Hawaii.

Risk category	biofuel	random
High	28 (70%)	10 (25%)
Evaluate	3 (8%)	4 (10%)
Low	9 (22%)	24 (60%)
not assessable	0 (0%)	2 (5%)

Table 2. The number (percentages) of biofuel crops (n = 40) and a random selection of introduced (n = 40) species with their invasiveness status in this study; to calculate percentages for biofuels naturalized and invasive in Hawaii we use biofuel species present in Hawaii for the denominator (i.e., 38).

Status	biofuel	random
Present in Hawaii	38 (95%)	40 (100%)
Naturalized in Hawaii	22 (58%)	5 (13%) **
Invasive in Hawaii	12 (32%)	5 (13%)
Invasive elsewhere	24 (60%)	8 (20%) **

**Binomial proportion tests significant at the 0.001 level.



Majority of images courtesy of Forest & Kim Starr

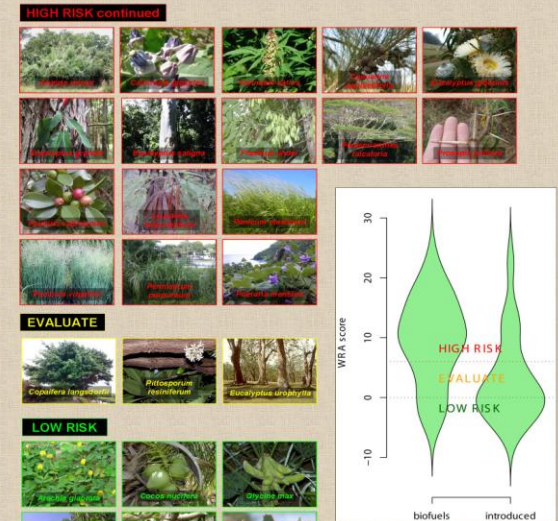


Figure 1. Density distributions of WRA scores of biofuels compared to a random selection of other introduced species; scores were significantly different (Wilcoxon exact test $W = 1135.5$ p.0.001).

Conclusions/Significance: Because of climatic and ecological similarities, predictions of biofuel crop invasiveness in Hawaii are applicable to other vulnerable island and subtropical ecosystems worldwide. We demonstrate the utility of an accessible and scientifically proven risk assessment protocol that allows users to predict if introduced species will become invasive in their region of interest. Propagule pressure created by extensive plantings will likely exacerbate invasions, a scenario expected with large-scale biofuel crop cultivation. Proactive measures, such as risk assessments, should be employed to predict invasion risks, which could then be mitigated via implementation of appropriate planting policies and adoption of the "polluter-pays" principle.

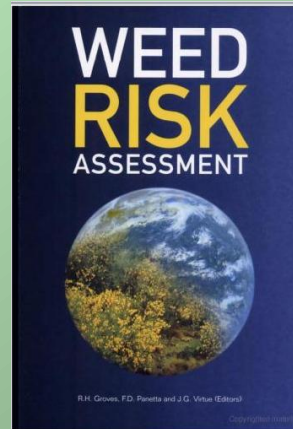
Majority of images courtesy of Forest & Kim Starr

Biofuels 1(5): 2010

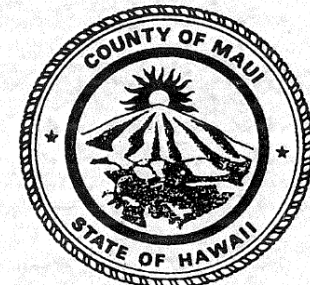
2009 Hawaii Conservation Conference WRA Poster

Applications of the WRA Worldwide

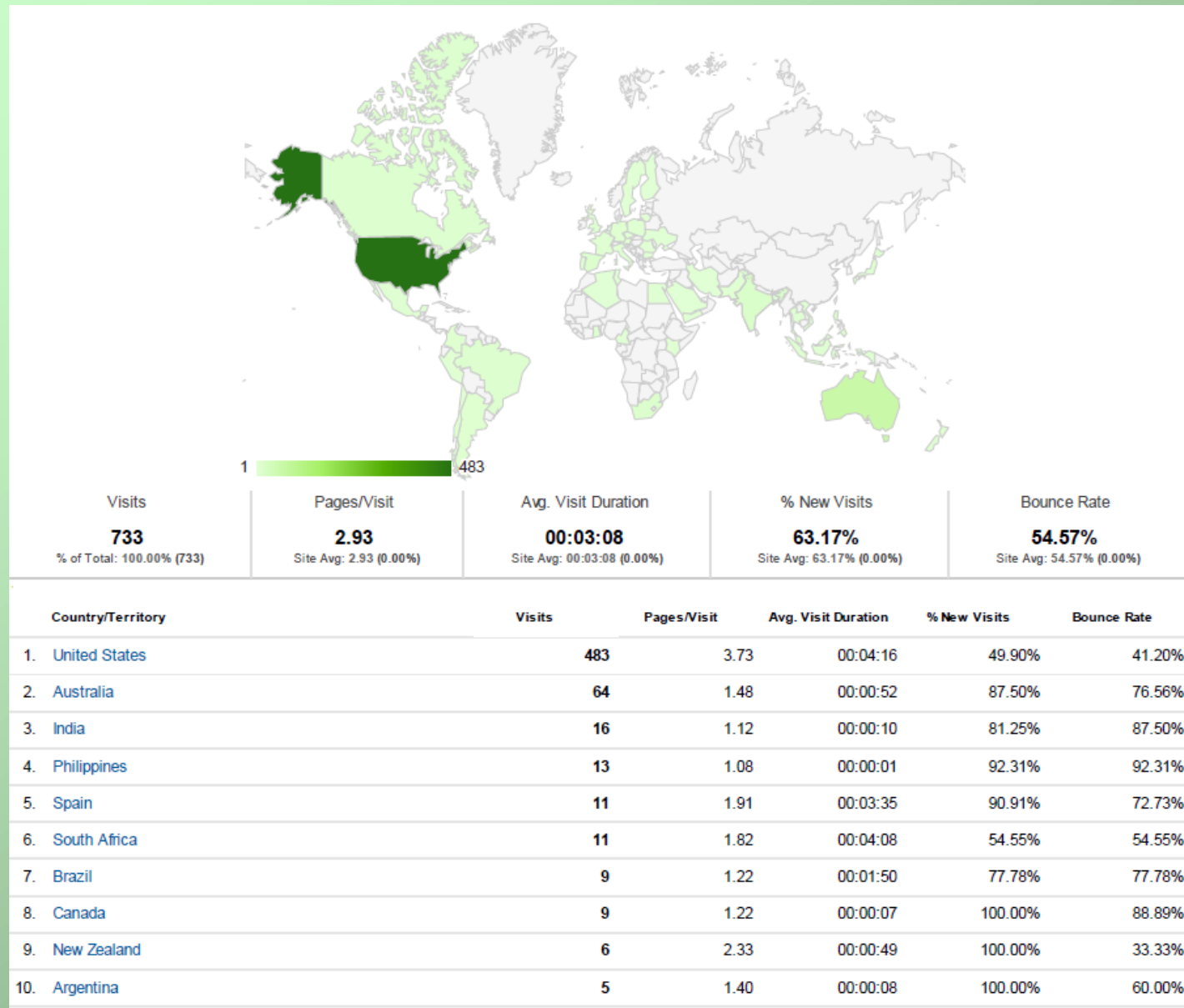
- Australia
 - Evaluation
 - Regulatory implementation
- New Zealand
 - Regulatory implementation
- Czech Republic
 - Evaluation
- Bonin Islands (Japan)
 - Evaluation
- New York State
 - Regulatory implementation
- Florida, Texas, Canada
 - Evaluation
- Hawaii and Pacific
 - Voluntary implementation (Codes of Conduct)
 - Educational Tool
 - Evaluation



MAUI COUNTY PLANTING PLAN



International Uses





Institute of Pacific Islands Forestry
Pacific Island Ecosystems at Risk
 (PIER)
 Plant threats to Pacific ecosystems



Caring for the
Land and
Serving
People

Welcome! Here you will find listings and descriptions of **plant species that threaten ecosystems of the Pacific islands**. Also listed are many other invasive and potentially invasive plant species present in and around the Pacific region.

Google Custom Search

Search PIER

- **Species lists** by scientific name, common name, location, etc.

Direct link to all species by scientific name: [Scientific Names List](#)

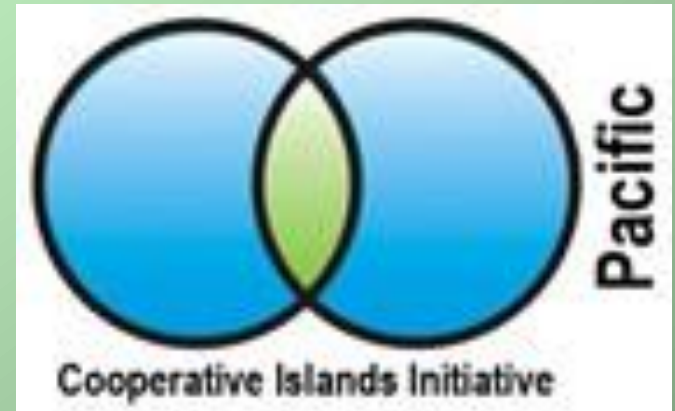
- **Risk assessments** for invasive and potentially invasive species
- **Reports** on invasive species on Pacific islands
- **Other publications**
- Invasive species in Hawaii: [Hawaiian Ecosystems at Risk \(HEAR\)](#)

[About the PIER project](#)
[How to use PIER](#)
[Our cooperators](#)
[Related sites](#)
[Site index](#)
[References](#)
[How to cite PIER](#)
[PIER DVD](#)

Recent additions to PIER:

- 78 new **risk assessments** for Hawaii and the Pacific Islands.
- Hong Kong species from the "[Check List of Hong Kong Plants](#)".
- ...and new species, locations, common names and other updates.

What happened to *Chamaesyce*? Most of the species formerly listed as *Chamaesyce* are now listed as *Euphorbia* to conform to current taxonomy.



Pacific Invasives Initiative



- “We use the WRAs as both a technical and educational tool.”
- “It may well be that the Hawai`i WRAs are not be the most suitable for other Pacific countries and territories, but at the moment **they are the most valuable tool we have.**”
 - Bill Nagle, Project Coordinator, Pacific Invasives Initiative

Home

Designations

Assessments

- Download Assessments
- Submit an Assessment Request

Links

Sitemap

Home

<https://sites.google.com/site/weedriskassessment/home>

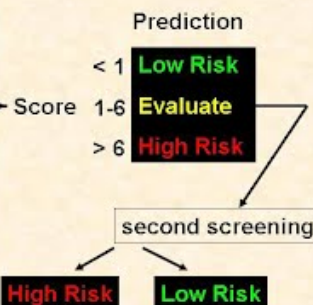
Welcome to the Hawai'i Pacific Weed Risk Assessment Site—49 questions about a plant

- **What is the Hawai'i Pacific Weed Risk Assessment (HPWRA)?** It is a screening tool to ask "background questions" about a plant before it is imported or widely planted in Hawai'i.
- **How does the HPWRA work?** HPWRA botanists look up published and on-line information to answer 49 questions about a plant's biology, ecology & invasive tendencies elsewhere. The answers result in a score that predicts whether a plant is likely to be invasive in Hawai'i or other tropical Pacific islands sharing a similar climate.

Hawaii Pacific Weed Risk Assessment System

49 questions

- domestication ?
- climate/distribution ?
- weed elsewhere ?
- undesirable traits ?
- plant type ?
- reproduction ?
- dispersal ?
- persistence attributes ?



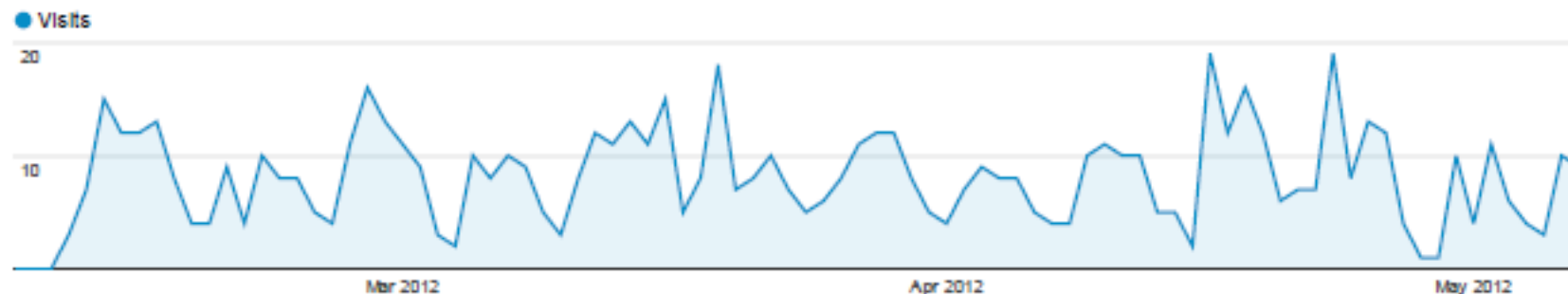
- **How accurate is the HPWRA?** The HPWRA is 95% accurate in catching the would-be invasive plants and 85% accurate at identifying non-pests.
- **Does it cost anything to use?** No. This is a FREE service to anyone that imports, grows, or sells plants or is otherwise curious about the potential behavior of particular plant.
- **Am I required to use it?** No. The HPWRA is voluntary for people who want to avoid planting or growing potentially invasive species.

Visitors Overview

Feb 8, 2012 - May 7, 2012

100.00% of total visits

Overview



466 people visited this site

Visits: 732

Unique Visitors: 466

Pageviews: 2,149

Pages/Visit: 2.94

Avg. Visit Duration: 00:03:08

Bounce Rate: 54.51%

% New Visits: 63.25%



63.39% New Visitor

464 Visits

36.61% Returning Visitor

268 Visits



[Home](#) | [About Us](#) | [Contact Us](#)

MAKING GOOD PLANTING DECISIONS FOR OUR 'ĀINA

Search Site

GO

[Why Plant Pono?](#)

[Invasive Plants](#)

[Non-invasive Plants](#)

[HPWRA](#)

[Plant Pono Forum](#)

[Additional Resources](#)



Fireweed in Maui Pasture

Invasive Plant Search

Search Invasive Plants

GO

These are a few of the plants that are being planted, yet their spread into forests and natural areas is cause for concern.

[Browse These Invasive Plants](#)

[View list of all high-risk plants](#)

Non-Invasive Plants

Search Alternative Plants

GO

INVASIVE PLANTS

[BROWSE ALL](#)



Grasses & Groundcovers

Some examples of grasses and groundcovers that are invasive in Hawai'i



Shrubs, Vines, & Others

Some examples of shrubs, vines and other types of plants that are invasive in Hawai'i



Trees

Some examples of trees that are invasive in Hawai'i

NON-INVASIVE PLANTS

[BROWSE ALL](#)

WRA Future Goals

- Continue timely update of completed assessments
- Continue assessments
- Update Excel-based assessments into database
- Collaborate on development of a web-based database
- Public Outreach
- Continue to provide content for Plant Pono



Conclusions

- The WRA system is an objective, effective, transparent AND economical tool for identifying and screening out pest plants
- If WRA ratings were used for importation and planting decisions, Hawai'i's invasive plant problems and the associated costs could be greatly reduced

