

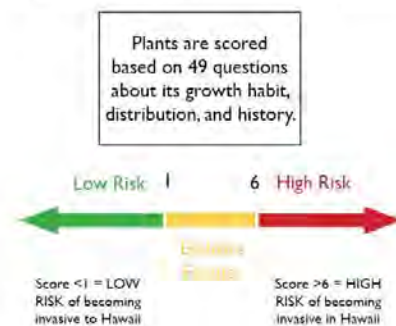
Title: Continued Support of the HPWRA

Organization: Hawaii-Pacific Weed Risk Assessment (HPWRA)

Award(s): \$117,838

Introduction: The Hawaii-Pacific Weed Risk Assessment (HPWRA) system is an internationally recognized screening tool that rates a plant's potential to become invasive by answering 49 questions about its biology, ecology and history of invasiveness elsewhere. The answers generate a score that predicts a plant's likelihood to be invasive in Hawaii or other tropical Pacific islands. For 18+ years, the HPWRA system has been an important tool for the promotion of responsible importation and planting decisions and has provided information necessary for preventing new invasive plant species from becoming unknowingly established and disseminated throughout the islands. The screening system addresses several goals and strategies developed by the 2015-2020 strategic planning process and recommendations of the Regional Biosecurity Plan for Micronesia and Hawaii and increases the capacity and collaboration within the Prevention, Established Pests, and Public Outreach Working Groups. The HPWRA program is available to international, federal, state, and county agencies and private sectors to use as a preventative measure to assess the risk of introducing or planting a species in the country, state, or county. In accordance with these objectives, a Weed Risk Assessment Specialist has been funded by the Hawaii Invasive Species Council to the amount of \$117,838 in 2019.

Hawaii Weed Risk Assessment System

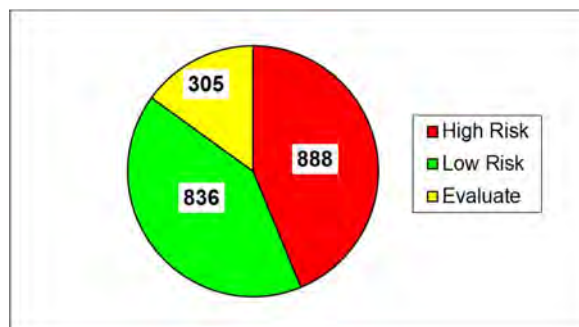


Achievements in 2019

1. New or Revised Assessments Completed and Entered into the WRA Database:

The HPWRA continues to provide new and to update old assessments, both for species already present in the Hawaiian Islands, as well as for new introductions. This information is summarized and disseminated to the requesting individual or agency via direct correspondence, and to the public and land management agencies through technical and general publications, websites, public presentations, and other outreach activities. From January to

December 2019, 120 new assessment requests were received, in addition to those received in the previous calendar year, and 102 assessments (62 new and 40 revised) were completed (see Appendix for detailed list of 2019 assessments).



2,029 Risk Assessments by Category

As of December 31, 2019, 2,029 assessments have been completed and assigned to the following categories:

- High Risk (888 plants): Predicted to become invasive in Hawaii or Pacific Island ecosystems
- Low Risk (836 plants): Not predicted to become invasive
- Evaluate (305 plants): Needs more information to make a prediction of invasiveness

Assessment requests in 2019 originated from members of the public as well as individuals associated with island invasive species committees, county, state and federal government agencies, private businesses, nurseries and botanical gardens, university researchers and extension agents, and international invasive species organizations, among others. The following is a list of highlights and accomplishments during this time period:

Island Invasive Species Committees (ISCs), Early Detection (ED)

Teams & Conservation Organizations: The HPWRA produced fifty-eight species assessments for Invasive Species Committees and conservation organizations to aid in early detection and prioritization for control of potentially invasive plants. Assessments provide scientifically researched information on a species' potential invasiveness to Hawaii and other Pacific Islands and a concise, consolidated source of current references useful to assist in management decisions. Of note were eleven assessments completed for the BIISC Early Detection program. The assessments provide supplemental information and are used as part of the process to determine which species should become future targets. Of further note were two assessments provided to the Maui Branch Manager of DOFAW for a wetlands restoration project, one for the Oahu Army Natural Resource Program considering a non-native grass for a slope stabilization project, and one for the US Fish and Wildlife Service commenting on a forestry proposal on Molokai.



**58 Assessments produced in 2019
for ISCs, ED Teams, & Conservation
Organizations**

Other Public and Private Organizations, Individual Plant Growers, and Landscape Professionals:

The HPWRA program receives screening requests from plant growers, landscape professionals, and both public and private individuals and institutions including the National Tropical Botanical Garden (NTBG), Honolulu Botanical Garden, University of Hawaii faculty and students, and others. Assessments are also provided for plants submitted to the Plant Pono liaison on behalf of the landscaping and nursery industries. Forty-four such assessments were completed in 2019. Of note were five assessments for a private consultant developing landscaping plans for Oahu developments, one for a forestry consultant advising ranchers on trees that could act as firebreaks and suppress invasive pasture weeds, and eight assessments for managers of a Maui-based cattle ranch interested in planting cover/refuge crops within silvicultural *Acacia koa* groves. The ranch intends to attract beneficial insects that may help control psyllids, without introducing new invasive plant species to the island. Of further note were two assessments provided to a Kauai nursery for their November Arbor Day tree giveaway, and one assessment (*Psophocarpus tetragonolobus*) for the Invasive Species Program Coordinator of the Lady Bird Johnson Wildflower Center in Austin, Texas.



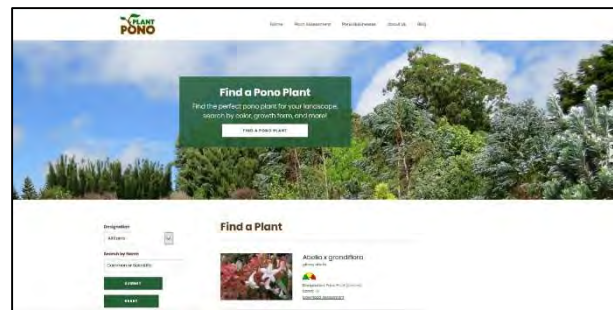
- 2. Public presentations and Outreach:** To promote awareness and encourage use of the HPWRA system, the WRA Specialist is involved in additional outreach activities with partner agencies and interested parties. The following highlights outreach activities and efforts from January – December 2019:

- 30 Jan: Two presentations to the East Hawai'i Master Gardeners 2019 class:
 - Weed Risk Assessment. What to Look for & Avoid When Selecting Non-Invasive Plants for Forestry, Gardening & Landscaping (30 attendees)
 - A whirlwind review of Hawaii's native plant taxa from A (*Abutilon*) to Z (*Zanthoxylum*) (25 attendees)
- 30 Jan: Presentation to Hamakua Resistance (6:30 pm – 8 pm: Invasive Species & Climate Change presentation)
- 11 Mar: Plant ID for Hamakua Harvest coordinator
- 12 Jun: HISC Brown Bag Series #23 (Hawaii-Pacific Weed Risk Assessment 2019 Update)
- 17 Oct: Plant ID class with BIISC (Hawaii Community College)



Jan 30: Presentations to East Hawaii Master Gardeners

- 3. hpwra.org & Partner Website Updates:** All new and previously completed assessments continue to be posted at hpwra.org. This site allows users to download individual assessments, as well as a regularly updated list of all assessments completed to date and serves as a backup to the Plant Pono website. From January 1, 2019 to December 31, 2019, the website received 1,201 visits and 4,565 page views, demonstrating continued interest and need for risk assessment predictions to make informed planting decisions.



The new Plant Pono website was relaunched in January 2019

At the end of January 2019, the new Plant Pono website (plantpono.org) was finally launched after months of work by the developer, Websites with Aloha, and valuable input provided by BIISC staff (especially Molly Murphy and Franny Brewer) as well as technical assistance from HBIN manager Sky Harrison. The relaunched site is now being regularly updated with new content, including new and revised weed risk assessments as they are completed.

Summary of website developments (January 2019 – December 2019):

- 2,029 assessments posted to hpwra.org (<https://sites.google.com/site/weedriskassessment/home>)
 - HPWRA Project website (<https://sites.google.com/site/hpwraproject/>) provides access to the work calendar, quarterly and annual reports, and other HPWRA-related documentation.
- 4. Documentation of all WRA Specialist responses to public inquiries about the invasiveness of plants, plant identifications, and plant assessment results:** The WRA Specialist responded to 67 plant-related calls, providing information on identification, impacts and control of invasive, non-native plants.

5. Other Activities in 2019

The WRA Specialist has participated in or contributed to a number of activities pertaining to invasive species and conservation in the Hawaiian Islands, often working with partner agencies or community groups. A complete list of such activities is itemized in the HPWRA quarterly reports, and is available at the HPWRA Project website ([Project Documents and Links](#)). A few highlights from 2019 are as follows:

- 08 Jan: Kalopa State Park banyan control (with BIISC & PMKCA)
- 15 Jan: BIISC Steering Committee
- 05 Feb: *Manduca blackburni* Sphinx Moth surveys
- 26 Feb: Hawaii Island Vegetation Management Collaborative Action Plan Workshop
- 05 Mar: Kalopa State Park banyan control and sign work (with PMKCA)
- 27 Mar: Nahelehele Dryland Forest Symposium
- 17 Apr: Koa planting at Pu'u Wa'awa'a Forest Reserve
- 24 Apr: Ka'ohe Restoration Area outplanting with Mauna Kea Forest Restoration Partnership
- 28 May: ROD Science Symposium
- 31 May: Participate in ROD field trip to Kalopa State Park (as part of ROD Science Symposium)
- 06 Jun: Kalopa State Park banyan control (with PMKCA)
- 13 Jun: Trip to Hakalau Forest NWR with Island Frugivory working group
- 22 Aug: CTAHR Invasive Species Conference (Hilo)
- 29 Aug: HISC/CGAPS Invasive Species Strategy Workshop
- 05 Sep: Kalopa State Park banyan control (with PMKCA)
- 19 Sep: BIISC Target Prioritization SOP meeting
- 01 Oct: BIISC steering committee (Hilo)
- 22 Oct: PMKCA Invasive Species Committee planning (Pa'auilo)
- 07 Nov: Kalopa State Park banyan control (with PMKCA)
- 06 Nov: PMKCA Invasive Species Committee (Pa'auilo)
- 07 Nov: Kalopa State Park banyan control (with PMKCA)
- 04 Dec: HISC Research & Technology Working Group (Conference Call)
- 05 Dec: Kalopa State Park banyan control (with PMKCA)



Mar 5: New sign for Kalopa State Park nature trail



17 Apr: Koa planting at Pu'u Wa'awa'a Forest Reserve



07 Nov: Kalopa State Park Banyan Control

Appendix: Assessments completed in 2019

Family	Taxa	Common Name	WRA Score	WRA Rating	Date
Malvaceae	Abroma augusta	devil's cotton	4	Evaluate	9/9/2019
Fabaceae	Acacia vestita	hairy wattle, weeping boree	2	Low Risk	1/1/2019
Zingiberaceae	Alpinia carolinensis	Caroline alpinia	5	Evaluate	2/14/2019
Asteraceae	Arctium lappa	great burdock, gobo	9	High Risk	5/14/2019
Rubiaceae	Atractocarpus fitzalanii	brown gardenia, randia, yellow mangosteen	6	High Risk	8/16/2019
Acanthaceae	Barleria lupulina	hophead Philippine violet, hop-headed barleria	15	High Risk	11/20/2019
Poaceae	Bothriochloa bladhii	caucasian bluestem, forest bluegrass	19	High Risk	8/20/2019
Zygophyllaceae	Bulnesia arborea	Maracaibo lignum vitae, verawood	-5	Low Risk	6/4/2019
Anacardiaceae	Camptosperma brevipedunculatum	camptosperma, Solomon Islands maple	4	High Risk	9/24/2019
Cannabaceae	Cannabis sativa	marijuana, hemp, paka lolo	12	High Risk	2/27/2019
Asteraceae	Centaurea melitensis	cockspur thistle, Maltese star thistle	21	High Risk	8/23/2019
Solanaceae	Cestrum elegans	crimson cestrum, red cestrum, purple cestrum	19	High Risk	5/27/2019
Fabaceae	Chamaecrista nictitans	partridge pea	8	High Risk	12/1/2019
Asteraceae	Cichorium intybus	chicory, coffee chicory, French endive, witloof	17	High Risk	1/18/2019
Lamiaceae	Clerodendrum thomsoniae	bleeding glory bower, bleeding heart vine	9	High Risk	6/14/2019
Rubiaceae	Coffea arabica	wild coffee, Arabian coffee, arabica coffee	9	High Risk	5/10/2019
Boraginaceae	Cordia alliodora	Spanish elm, Ecuador laurel, salmwood, cypre	11	High Risk	7/29/2019
Boraginaceae	Cordia lutea	yellow geiger, muyuyo, yellow cordia	5	Evaluate	2/25/2019
Cupressaceae	Cunninghamia lanceolata	China fir, Chinese fir	3	Evaluate	1/11/2019
Cyperaceae	Cyperus fulvus	sticky sedge	8	High Risk	11/13/2019
Poaceae	Dactyloctenium australe	Natal crowfoot, sweet smother grass	6	Evaluate	3/23/2019
Dicksoniaceae	Dicksonia fibrosa	golden tree fern, kuripaka, wheki-ponga	10	High Risk	10/21/2019
Dicksoniaceae	Dicksonia squarrosa	harsh tree fern, rough tree fern, wheki	18	High Risk	9/11/2019
Cyperaceae	Eleocharis geniculata	bent spikerush, Canada spikesedge	13	High Risk	8/8/2019
Zingiberaceae	Elettaria cardamomum	cardamom, green cardamom, true cardamom	3	Low Risk	2/12/2019
Asteraceae	Emilia sonchifolia	Flora's paintbrush, sow thistle	13	High Risk	3/17/2019
Fabaceae	Erythrina bidwillii	Bidwell's coral tree, fireman's cap	-4	Low Risk	7/3/2019

For more information, please contact: hpwra@hawaii.edu or visit hpwra.org

Family	Taxa	Common Name	WRA Score	WRA Rating	Date
Euphorbiaceae	Euphorbia cyathophora	dwarf poinsettia, fire-on-the-mountain, Mexican fire plant, painted spurge	10	High Risk	11/25/2019
Euphorbiaceae	Euphorbia prostrata	prostrate sandmat, prostrate spurge	18	High Risk	4/16/2019
Poaceae	Festuca californica	California fescue	7	High Risk	5/13/2019
Poaceae	Festuca rubra	creeping fescue, red fescue	19	High Risk	2/7/2019
Moraceae	Ficus macrophylla	Moreton bay fig, Australian banyan, black fig	9	High Risk	10/15/2019
Moraceae	Ficus nota	sacking tree, tibig	8	High Risk	11/5/2019
Moraceae	Ficus platypoda	desert fig, rock fig, small-leaf Moreton Bay fig	10	High Risk	11/18/2019
Sapindaceae	Filicium decipiens	fern tree, fern leaf	5	Evaluate	7/30/2019
Fabaceae	Gliricidia sepium	mother of cocoa, madre de cacao, Nicaraguan cocoashade, quick-stick	8	High Risk	12/17/2019
Poaceae	Hakonechloa macra	hakone grass, Japanese forest grass	4.5	Low Risk	6/26/2019
Aquifoliaceae	Ilex cassine	Dahoon holly	9	High Risk	6/24/2019
Rubiaceae	Ixora chinensis	Chinese ixora	0	Low Risk	12/6/2019
Vitaceae	Leea guineensis	burgundy leea, Hawaiian holly, West Indian holly	-1	Low Risk	10/8/2019
Vitaceae	Leea indica	bandicoot berry	4	Evaluate	10/7/2019
Proteaceae	Leucadendron argenteum	Cape silvertree, silvertree	-3	Low Risk	5/21/2019
Linaceae	Linum bienne	narrow leaved flax, pale flax, small flowered flax	8	High Risk	5/24/2019
Altingiaceae	Liquidambar styraciflua	alligatorwood, American sweetgum, bilsted	7	High Risk	2/4/2019
Hamamelidaceae	Loropetalum chinense	fringe flower, Chinese fringe flower	-2	Low Risk	3/14/2019
Fabaceae	Lotus corniculatus	bird's foot trefoil	16	High Risk	2/19/2019
Solanaceae	Lycium barbarum	goji berry, matrimony vine, Chinese boxthorn	15	High Risk	8/28/2019
Bignoniaceae	Markhamia zanzibarica	bell bean tree, maroon bell bean	-4	Low Risk	10/29/2019
Fabaceae	Medicago sativa	alfalfa, lucerne	12	High Risk	2/22/2019
Myrtaceae	Melaleuca alternifolia	narrow leaf paperbark, narrow leaf teatree	7	High Risk	4/4/2019
Myrtaceae	Melaleuca bracteata	black teatree, river tea-tree, white cloudberry	9	High Risk	12/4/2019
Fabaceae	Melilotus officinalis	yellow sweet clover, field melilot, yellow trefoil	14	High Risk	3/1/2019
Poaceae	Melinis nerviglumis	bristle-leaved red top, pink bubble grass, pink crystals, ruby grass	10	High Risk	10/25/2019
Malvaceae	Melochia umbellata	melochia, hierba del soldado, tangkal bintenoo	9	High Risk	10/23/2019

Family	Taxa	Common Name	WRA Score	WRA Rating	Date
Fabaceae	Milletia grandis	umzimbeet	-2	Low Risk	6/7/2019
Fabaceae	Myroxylon balsamum	balsam of Peru, balsam of Tolu, Peru balsam	8	High Risk	10/16/2019
Podocarpaceae	Nageia nagi	Asian bayberry, broadleaf Podocarpus, nagi	-3	Low Risk	12/20/2019
Fabaceae	Onobrychis viciifolia	sainfoin, esparcet, holy clover	3.5	Low Risk	1/23/2019
Oxalidaceae	Oxalis debilis	large flower pink sorrel, pink shamrock	9	High Risk	4/10/2019
Oxalidaceae	Oxalis stricta	yellow sheep sorrel, yellow wood sorrel	16.5	High Risk	3/29/2019
Acanthaceae	Peristrophe speciosa	purple rice plant	7	High Risk	10/31/2019
Polygonaceae	Persicaria odorata	rau ram, Vietnamese coriander	0	Low Risk	6/20/2019
Plantaginaceae	Plantago major	broadleaf plantain, greater plantain	18	High Risk	3/8/2019
Polypodiaceae	Platycerium superbum	staghorn fern, giant staghorn	4	Evaluate	12/11/2019
Fabaceae	Platymiscium stipulare	platymiscium	6	Evaluate	4/30/2019
Asteraceae	Pseudogynoxys chenopodioides	Mexican flamevine	10	High Risk	10/12/2019
Fabaceae	Psophocarpus tetragonolobus	winged bean, asparagus pea, Goa bean	0	Low Risk	6/3/2019
Melastomataceae	Pterolepis glomerata	false meadow beauty	13	High Risk	8/26/2019
Amaranthaceae	Ptilotus nobilis	lamb's tail, regal foxtail, tall mulla	-2	Low Risk	1/7/2019
Arecaceae	Ptychosperma macarthurii	cluster palm, hurricane palm, Macarthur palm	4	High Risk	12/30/2019
Rosaceae	Pyracantha crenatoserrata	firethorn	13	High Risk	10/10/2019
Polypodiaceae	Pyrrosia piloselloides	dragons scale fern	12	High Risk	10/9/2019
Fabaceae	Retama raetam	white weeping broom	10	High Risk	7/24/2019
Rosaceae	Rosa laevigata	Cherokee rose, jin ying zi	18	High Risk	10/4/2019
Rosaceae	Rosa rugosa	Japanese rose, rugose rose, Turkestan rose	10	High Risk	4/25/2019
Arecaceae	Roystonea regia	Cuban royal palm, Florida royal palm, royal palm	2	Evaluate	12/31/2019
Acanthaceae	Ruellia simplex	Mexican blue bells, Mexican petunia	20	High Risk	5/8/2019
Adoxaceae	Sambucus mexicana	Mexican elderberry, blue elderberry	9	High Risk	9/26/2019
Rosaceae	Sanguisorba minor	garden burnet, little burnet, small burnet	10	High Risk	1/25/2019
Cyperaceae	Schoenus apogon	common bog sedge, fluke bog rush	3	Evaluate	8/14/2019
Fabaceae	Senna spectabilis	spectacular cassia, crown of gold tree	10	High Risk	9/20/2019

Family	Taxa	Common Name	WRA Score	WRA Rating	Date
Malvaceae	Sida spinosa	prickly mallow, prickly sida, spiny sida	15	High Risk	5/3/2019
Asteraceae	Smallanthus sonchifolius	yacón, earth apple, sweet root	-1	Low Risk	8/1/2019
Solanaceae	Solanum asperolanatum	devil's fig	7	High Risk	3/26/2019
Solanaceae	Solanum seaforthianum	Brazilian nightshade, climbing nightshade	12	High Risk	4/22/2019
Asteraceae	Sonchus arvensis	corn sow thistle, perennial sow thistle	17	High Risk	3/18/2019
Asteraceae	Sonchus asper	prickly sow thistle, spiny leaf sow thistle	21	High Risk	3/21/2019
Asteraceae	Sonchus oleraceus	annual sow thistle, common milk thistle	18	High Risk	3/19/2019
Sphagnaceae	Sphagnum palustre	peat moss, boat-leaved sphagnum	11	High Risk	9/17/2019
Proteaceae	Stenocarpus sinuatus	wheel of fire, Queensland fire wheel tree	0	Low Risk	6/29/2019
Acanthaceae	Strobilanthes hamiltoniana	Chinese rain bell, temple bells	11	High Risk	11/11/2019
Apocynaceae	Strophanthus amboensis	elephant vine, knob-stemmed poisonrope	1	Evaluate	9/4/2019
Euphorbiaceae	Suregada multiflora	false lime tree	0	Low Risk	7/1/2019
Asteraceae	Synedrella nodiflora	nodeweed, cinderella weed, synedrella	15	High Risk	3/13/2019
Myrtaceae	Syzygium polyanthum	Indian bayleaf, Indonesian bayleaf	3	High Risk	9/13/2019
Bignoniaceae	Tabebuia heterophylla	pink manjack, pink tecoma, pink trumpet tree	5	Evaluate	12/27/2019
Fabaceae	Trifolium pratense	red clover, cowgrass clover	13	High Risk	3/6/2019
Poaceae	Urochloa mutica	California grass, buffalo grass, para grass	18	High Risk	5/16/2019
Fabaceae	Vigna hosei	Sarawak bean	9	High Risk	8/12/2019
Vochysiaceae	Vochysia guatemalensis	white mahogany, white yemeri, árbol de cuerpo	1	Evaluate	8/6/2019
Myrtaceae	Xanthostemon chrysanthus	golden penda	1	Low Risk	4/29/2019
Asteraceae	Youngia japonica	Oriental hawksbeard, Oriental false hawksbeard	14	High Risk	3/12/2019