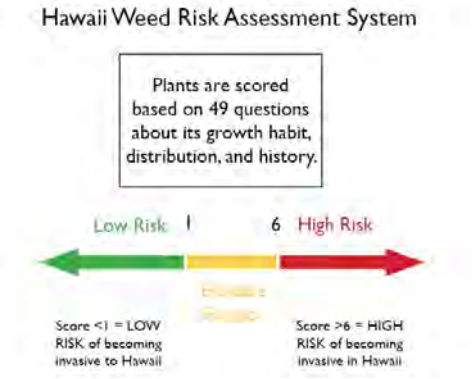
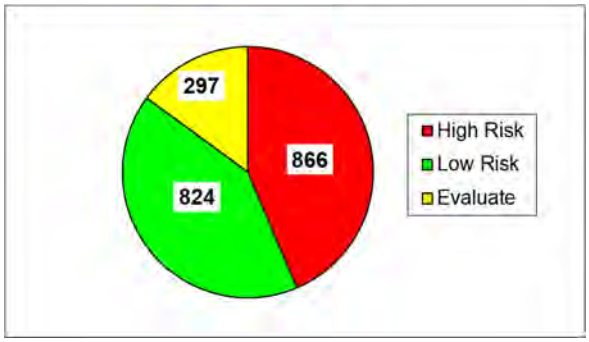



**Title:** Continued Support of the HPWRA
**Organization:** Hawaii-Pacific Weed Risk Assessment (HPWRA)
**Award(s):** $100,000.00

**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 17+ 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 $100,000 in 2018.

***Achievements in 2018***

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 2018, 94 new assessment requests were received, in addition to those received in the previous calendar year, and 104 assessments (76 new and 28 revised) were completed (see Appendix for detailed list of 2018 assessments).




**1,987 Risk Assessments by Category**

As of December 31, 2018, 1,987 assessments have been completed and assigned to the following categories:

- High Risk (866 plants): Predicted to become invasive in Hawaii or Pacific Island ecosystems
- Low Risk (824 plants): Not predicted to become invasive
- Evaluate (297 plants): Needs more information to make a prediction of invasiveness

Assessment requests in 2018 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-three 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 eighteen assessments completed for the KISC and BIISC Early Detection programs. 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 four assessments provided to the USDA-NRCS State Grazing Land Management Specialist for plants considered as potential grazing and pasture amendments for Hawaii island ranches. All four received a High Risk rating and were removed from further consideration.

**53 Assessments produced in 2018 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. Fifty-one such assessments were completed in 2018. Of note were eight rare or novel plants introduced for cultivation and conservation purposes at the National Tropical Botanical Gardens on Kauai. NTBG has been submitting plants for screening prior to cultivation since 2013. Other assessments of interest include two plants whose seeds were donated from Hiroshima, Japan to the Honolulu Botanical Garden as part of the World Peace plantings. The seeds from *Aphananthe aspera* and *Celtis sinensis* var. *japonica* were significant because they came from trees that survived the atomic bomb in 1945.

***Aphananthe aspera* (Low Risk), screened for cultivation at Honolulu Botanical Garden.**

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 2018:

- 30 Jan: Two presentations to the West Hawai'i Master Gardeners 2018 class:

  - Weed Risk Assessment. What to Look for & Avoid When Selecting Non-Invasive Plants for Forestry, Gardening & Landscaping (25 attendees)
  - A whirlwind review of Hawaii's native plant taxa from A (*Abutilon*) to Z (*Zanthoxylum*) (25 attendees)
- 31 Jan: Two presentations to the East Hawai'i Master Gardeners class (see above)
- 13 Apr: Native garden tour for Kamehameha Schools teachers
- 18 Apr: Presentation to Maui Master Gardeners 2018 class: A whirlwind review of Hawaii's native plant taxa from A (*Abutilon*) to Z (*Zanthoxylum*) (20 attendees)
- 06 June: Full day botany training for MISC staff (4 presentations/lectures given)
- 21 Oct: Volunteer at ʻŌhiʻa Love Fest (Don't Move ʻŌhiʻa Interisland Booth)
- 16 Dec: Provided invasive plant ID & information at Hamakua Harvest farmer's market


**WRA Presentation to East Hawaii, West Hawaii and Maui Master Gardener programs**

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. From January 1, 2018 to December 31, 2018, the website received 2,554 visits and 6,739 page views, demonstrating continued interest and need for risk assessment predictions to make informed planting decisions.


**The original Plant Pono website was hacked in March 2018**

At the end of March 2018, the Plant Pono website (https://plantpono.org/) was hacked and had to be taken down due to compromised security. In the summer of 2018, BIISC and CGAPS acquired funding to design a new site for the Plant Pono program. In the ensuing months of August through December, a significant amount of time was dedicated by BIISC staff, HBIN staff, website developers and the WRA Specialist to design and update the new site, anticipated for relaunch in early 2019.

Summary of website developments (January 2018 – December 2018):

- 1,987 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.
- A total of 104 hours (13 full work days) dedicated to working on the new Plant Pono website

4. **Documentation of all WRA Specialist responses to public inquiries about the invasiveness of plants, plant identifications, and plant assessment results:** The WRA Specialist, stationed on

Maui for the first half of 2018, and Hawaii island from July through December, responded to 22 plant-related calls, providing information on identification, impacts and control of invasive, non-native plants.

### *5. Other Activities in 2018*

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 2018 are as follows**:**

**07 Sep: Seed collection for Waikoloa Dry Forest Initiative restoration**

- 18 Jan: Statewide ROD meeting (conference call)
- 02 Feb: Peer review Pacific Science submission
- 08 Mar: MISC Meeting (priority setting)
- 09 Mar: RotoROD call (to discuss placement of ROD air samplers on Maui)
- 07 Apr: Review HCC abstracts
- 01 May: Chaired Maui Nui ROD Working Group meeting
- 07 June: Meeting with Anders Lyons to discuss Maui Nui ROD Incident Action Plan
- 19 Jul: Statewide ROD meeting (conference call)
- 15 Aug: BIISC Steering Committee meeting
- 07 Sep: Waikoloa Dry Forest Initiative Seed Collection
- 18 Sep: Ka‘ohe Restoration Area Outplanting with Mauna Kea Forest Restoration Partnership (MKFBRP)
- 26 Sep: Meeting with USDA NRCS Waimea representative to schedule botany training
- 27 Sep: PCSU peer review
- 2 Oct: Ka‘ohe Restoration Area Outplanting with MKFBRP
- 13 Nov: Kalopa State Park banyan control (with BIISC & PMKCA)
- 29 Nov: BIISC target prioritization meeting
- 4 Dec: Kalopa State Park banyan control (with BIISC & PMKCA)
- 5 Dec: Edit MISC newspaper article
- 14 Dec: Contribute content to Native Hawaiian Plant Society Newsletter

**18 Sep: *Sophora chrysophylla* outplanting - Kaohe Restoration Area**

**Nov-Dec: Kalopa State Park Banyan Control**

**Appendix: Assessments completed in 2018**

| Family | Taxa | Common name | WRA score | WRA rating | Date |
|---|---|---|---|---|---|
| Fabaceae | *Acacia holosericea* | candelabra wattle, silverleaf wattle | 7 | High Risk | 5/18/2018 |
| Cactaceae | *Acanthocereus tetragonus* | barbed-wire cactus, triangle cactus, sword-pear | 16 | High Risk | 11/1/2018 |
| Bromeliaceae | *Aechmea bracteata* | vase bromeliad, gallito | 7 | High Risk | 4/11/2018 |
| Podocarpaceae | *Afrocarpus mannii* | São Tomé yellow-wood, pinheiro da terra | -1 | Low Risk | 10/16/2018 |
| Didiereaceae | *Alluaudia procera* | Madagascar ocotillo, Arbre Pieuvre | -6 | Low Risk | 5/2/2018 |
| Rhamnaceae | *Alphitonia excelsa* | Cooper's wood, red ash, soaptree, whiteleaf | 5 | High Risk | 10/19/2018 |
| Malvaceae | *Alyogyne huegelii* | lilac hibiscus | -2 | Low Risk | 5/3/2018 |
| Asteraceae | *Ambrosia psilostachya* | western ragweed, perennial ragweed | 16 | High Risk | 5/4/2018 |
| Poaceae | *Andropogon glomeratus* | bushy bluestem, bushy beard grass | 16 | High Risk | 5/14/2018 |
| Poaceae | *Andropogon virginicus* | broomsedge, yellow bluestem, whiskey grass | 22 | High Risk | 5/7/2018 |
| Poaceae | *Anthoxanthum odoratum* | sweet vernalgrass | 14 | High Risk | 5/16/2018 |
| Moraceae | *Antiaris toxicaria* | bark cloth tree, bark cloth tree, sackingtree | 3 | Evaluate | 12/4/2018 |
| Cannabaceae | *Aphananthe aspera* | mukutree, scabrous aphananthe | 0 | Low Risk | 1/25/2018 |
| Araucariaceae | *Araucaria hunsteinii* | klinki pine, klinkii pine | 0 | Low Risk | 12/21/2018 |
| Aristolochiaceae | *Aristolochia elegans* | calico flower, elegant Dutchman's pipe | 14 | High Risk | 7/23/2018 |
| Aristolochiaceae | *Aristolochia ringens* | gaping dutchman's pipe | 8 | High Risk | 7/20/2018 |
| Melastomataceae | *Arthrostemma ciliatum* | pinkfringe, everblooming eavender | 10 | High Risk | 7/9/2018 |
| Aspleniaceae | *Asplenium antiquum* | ō-tani-watari, bird's-nest fern | 1 | Low Risk | 8/27/2018 |
| Acanthaceae | *Barleria cristata* | bluebell, Philippine violet | 14 | High Risk | 12/17/2018 |
| Fabaceae | *Bolusanthus speciosus* | wisteria tree, elephant's wood, mogaba | -4 | Low Risk | 2/22/2018 |
| Malvaceae | *Brachychiton rupestris* | narrow-leaf bottletree, Queensland bottletree | 1 | Evaluate | 1/3/2018 |
| Celastraceae | *Brexia madagascariensis* | brexia | 2 | Low Risk | 7/27/2018 |
| Myrtaceae | *Calothamnus quadrifidus* | one-sided bottlebrush, common net bush | 6 | Evaluate | 1/8/2018 |
| Apocynaceae | *Calotropis gigantea* | crown flower, crownplant, giant-milkweed | 12 | High Risk | 3/22/2018 |
| Fabaceae | *Castanospermum australe* | beantree, Moreton Bay chestnut | 1 | Low Risk | 11/9/2018 |
| Cannabaceae | *Celtis sinensis* | Chinese hackberry, Chinese nettletree | 12 | High Risk | 1/29/2018 |
| Poaceae | *Cenchrus longisetus* | feathertop, feather grass | 21 | High Risk | 4/27/2018 |
| Combretaceae | *Conocarpus erectus* | button mangrove, buttonwood, sea mulberry | 5 | Evaluate | 7/31/2018 |
| Asparagaceae | *Cordyline fruticosa* | red ti | 4 | Evaluate | 4/25/2018 |
| Myrtaceae | *Corymbia ficifolia* | red-flowering gum, scarlet-flowering gum | 0 | Low Risk | 2/21/2018 |

| Family | Taxa | Common name | WRA score | WRA rating | Date |
|---|---|---|---|---|---|
| Fabaceae | *Crotalaria verrucosa* | blue rattleweed, blue-flower rattlepod | 10 | High Risk | 1/18/2018 |
| Poaceae | *Cymbopogon winterianus* | Burma citronella, Java citronella, Winter's grass | -5 | Low Risk | 3/1/2018 |
| Dryopteridaceae | *Cyrtomium falcatum* | holly fern, house holly fern | 14 | High Risk | 9/17/2018 |
| Podocarpaceae | *Dacrycarpus imbricatus* | kajoerapat, kimerah, podocarp | 5 | Evaluate | 10/12/2018 |
| Orchidaceae | *Dendrobium antennatum* | green antelope orchid | 7 | High Risk | 9/5/2018 |
| Orchidaceae | *Dendrobium crumenatum* | dove orchid, pigeon orchid | 1 | Low Risk | 7/26/2018 |
| Orchidaceae | *Dendrobium mirbelianum* | dark-stemmed antler orchid, mangrove orchid | 4 | Low Risk | 10/4/2018 |
| Fabaceae | *Derris elliptica* | tubaroot | 8 | High Risk | 7/13/2018 |
| Iridaceae | *Dietes bicolor* | African iris, butterfly flag, fortnight lily | 11 | High Risk | 10/29/2018 |
| Ehretiaceae | *Ehretia microphylla* | fukien tea, Philippine tea (Carmona retusa) | 7 | High Risk | 7/16/2018 |
| Orchidaceae | *Epidendrum nocturnum* | night scented orchid, night fragrant epidendrum | 4 | Low Risk | 8/31/2018 |
| Apiaceae | *Eryngium foetidum* | culantro, spiny coriander, fitweed | 15 | High Risk | 4/30/2018 |
| Fabaceae | *Erythrina vespertilio* | bat-wing coraltree, beantree, grey corkwood | -4 | Low Risk | 1/11/2018 |
| Myrtaceae | *Eucalyptus pulchella* | white peppermint, narrow-leaf peppermint | 1 | Evaluate | 7/18/2018 |
| Moraceae | *Fatoua villosa* | hairy crabweed, mulberry-weed | 9 | High Risk | 1/24/2018 |
| Phyllanthaceae | *Flueggea virosa* | white-berry bush, common bushweed | 7 | High Risk | 9/14/2018 |
| Rubiaceae | *Gardenia latifolia* | Ceylon boxwood, Indian boxwood, tree gardenia | 0 | Low Risk | 2/21/2018 |
| Iridaceae | *Gladiolus dalenii* | dragon's head lily, parrot lily, sword lily | 8 | High Risk | 6/12/2018 |
| Apocynaceae | *Gomphocarpus physocarpus* | balloon plant, balloon cottonbush, swanplant | 23 | High Risk | 9/24/2018 |
| Gunneraceae | *Gunnera tinctoria* | Chilean rhubarb, giant rhubarb | 12 | High Risk | 10/7/2018 |
| Stilbaceae | *Halleria lucida* | tree fuchsia, African honeysuckle, white olive | 8 | High Risk | 1/22/2018 |
| Boraginaceae | *Heliotropium amplexicaule* | blue heliotrope, clasping heliotrope | 20 | High Risk | 7/12/2018 |
| Cannabaceae | *Humulus lupulus* | common hop, European hop | 8.5 | High Risk | 4/23/2018 |
| Fabaceae | *Kennedia nigricans* | black coral-pea, black-bean | 4 | Evaluate | 2/6/2018 |
| Bignoniaceae | *Kigelia africana* | sausage tree | 0 | Low Risk | 2/15/2018 |
| Verbenaceae | *Lantana montevidensis* | trailing lantana, creeping lantana | 25 | High Risk | 3/15/2018 |
| Myrtaceae | *Leptospermum polygalifolium* | yellow tea tree, tantoon | 15 | High Risk | 8/7/2018 |
| Sapindaceae | *Majidea zanguebarica* | black pearl tree, mgambo tree, velvet seed tree | 2 | Evaluate | 11/15/2018 |
| Melastomataceae | *Medinilla multiflora* | Malaysian grapes, Malaysian orchid | 7 | High Risk | 12/13/2018 |
| Melastomataceae | *Melastoma malabathricum* | Indian rhododendron, Malabar melastome | 19 | High Risk | 5/23/2018 |

| Family | Taxa | Common name | WRA score | WRA rating | Date |
|---|---|---|---|---|---|
| Iridaceae | *Neomarica gracilis* | apostle plant, walking iris | 4 | Low Risk | 4/16/2018 |
| Solanaceae | *Nicotiana glauca* | tree tobacco, wild tobacco | 17 | High Risk | 8/7/2018 |
| Poaceae | *Paspalum atratum* | atra paspalum, capim-pojuca, pasto pojuca | 8 | High Risk | 2/9/2018 |
| Passifloraceae | *Passiflora ligularis* | sweet granadilla | 16 | High Risk | 6/28/2018 |
| Geraniaceae | *Pelargonium citronellum* | citronella pelargonium, lemon-scent pelargonium | 0 | Low Risk | 3/5/2018 |
| Rosaceae | *Photinia davidiana* | photina, Chinese stranvaesia, matchweed | 8 | High Risk | 9/3/2018 |
| Poaceae | *Phyllostachys edulis* | moso bamboo, tortoise-shell bamboo | 12 | High Risk | 4/3/2018 |
| Pinaceae | *Pinus caribaea* | Caribbean pine, pitch pine | 15 | High Risk | 3/19/2018 |
| Pinaceae | *Pinus jeffreyi* | Jeffrey pine | 3 | Evaluate | 10/24/2018 |
| Pinaceae | *Pinus pinaster* | cluster pine, maritime pine | 7 | High Risk | 3/12/2018 |
| Polypodiaceae | *Platycerium bifurcatum* | common staghorn fern, elkhorn fern | 4 | Evaluate | 5/24/2018 |
| Lamiaceae | *Plectranthus verticillatus* | gossip spurflower, money plant, Swedish ivy | 11 | High Risk | 7/11/2018 |
| Orchidaceae | *Polystachya concreta* | great yellow spike orchid, yellow spike orchid | 4 | Low Risk | 7/19/2018 |
| Urticaceae | *Pouzolzia guineensis* | Guinea pouzolzia, loko | 7 | High Risk | 9/12/2018 |
| Urticaceae | *Pouzolzia zeylanica* | graceful Pouzolz's-bush, wu shui ge | 8 | High Risk | 9/11/2018 |
| Rosaceae | *Prunus campanulata* | bellflower cherry, Taiwan cherry | 11 | High Risk | 9/21/2018 |
| Rosaceae | *Prunus persica* | peach | 4 | Evaluate | 8/2/2018 |
| Cyperaceae | *Rhynchospora caduca* | anglestem beak sedge, beak rush | 11 | High Risk | 6/25/2018 |
| Rosaceae | *Rubus glaucus* | Andean blackberry, Andes-berry | 17 | High Risk | 6/27/2018 |
| Rosaceae | *Rubus niveus* | Ceylon raspberry, hill raspberry, Mysore raspberry | 23 | High Risk | 8/8/2018 |
| Poaceae | *Saccharum ravennae* | Italian sugarcane, plume grass, ravenna grass | 12 | High Risk | 2/8/2018 |
| Salicaceae | *Salix cinerea* | common sallow, gray willow, pussy willow | 9 | High Risk | 2/1/2018 |
| Ochnaceae | *Sauvagesia erecta* | creole tea | 7 | High Risk | 12/10/2018 |
| Asteraceae | *Silybum marianum* | milk thistle, blessed milk thistle | 20.5 | High Risk | 9/9/2018 |
| Menispermaceae | *Stephania japonica* | ivyweed, snake vine, tapevine | 13 | High Risk | 11/21/2018 |
| Myrtaceae | *Syzygium grande* | sea apple | 8 | High Risk | 11/30/2018 |
| Myrtaceae | *Syzygium syzygioides* | kelat hitam | 6 | Evaluate | 11/27/2018 |
| Araliaceae | *Tetrapanax papyrifer* | rice-paper-plant | 12 | High Risk | 10/10/2018 |
| Malvaceae | *Theobroma cacao* | cocoa, cacao | -2 | Low Risk | 8/13/2018 |
| Apocynaceae | *Thevetia thevetioides* | giant thevetia, giant luckynut, cascabel grande | -1 | Low Risk | 6/26/2018 |

| Family | Taxa | Common name | WRA score | WRA rating | Date |
|---|---|---|---|---|---|
| Asteraceae | *Tithonia diversifolia* | Mexican sunflower, tree marigold | 23 | High Risk | 6/8/2018 |
| Melastomataceae | *Trembleya phlogiformis* | island glorybush | 5 | Evaluate | 7/10/2018 |
| Fabaceae | *Trifolium repens* | white clover | 12.5 | High Risk | 2/26/2018 |
| Typhaceae | *Typha latifolia* | common cattail, broadleaf cattail | 29 | High Risk | 6/5/2018 |
| Malvaceae | *Urena lobata* | aramina-plant, bur-mallow, Caesarweed | 16 | High Risk | 2/13/2018 |
| Poaceae | *Urochloa humidicola* | creeping signal grass, koronivia grass | 10 | High Risk | 2/12/2018 |
| Plantaginaceae | *Veronica plebeia* | common speedwell, creeping speedwell | 14 | High Risk | 4/12/2018 |
| Fabaceae | *Vigna luteola* | hairy cowpea, deer pea, dalrymple vigna | 12 | High Risk | 9/27/2018 |
| Fabaceae | *Wallaceodendron celebicum* | banuyo | -1 | Low Risk | 6/3/2018 |
| Fabaceae | *Wisteria sinensis* | Chinese wisteria, Chinese-glycine | 9 | High Risk | 1/17/2018 |
| Xyridaceae | *Xyris complanata* | feathered yellow-eye, yellow-eyed grass | 15 | High Risk | 3/10/2018 |
| Amaryllidaceae | *Zephyranthes citrina* | citron zephyrlily, yellow rain lily | 12 | High Risk | 5/31/2018 |
| Orchidaceae | *Zeuxine strateumatica* | lawn orchid, soldier orchid | 10 | High Risk | 7/24/2018 |
| Poaceae | *Zoysia matrella* | Korean grass, Manila grass, temple grass | 7 | High Risk | 4/1/2018 |