



***Plant Risk Evaluator -- PRE™
Evaluation Report***

Ardisia crenata -- Georgia

2017 Farm Bill PRE Project

PRE Score: 16 -- Reject (high risk of invasiveness)

Confidence: 76 / 100

Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public

Status: Completed

Evaluation Date: July 15, 2017

This PDF was created on August 13, 2018



Plant Evaluated

Ardisia crenata



Image by Augustus Binu



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Ardisia crenata*) in an effort to understand the invasive history, reproductive strategies, and the impact, if any, on the region's native plants and animals. This research reflects the data available at the time this evaluation was conducted.

Summary

Ardisia crenata is clearly a favored shrub of ornamental gardeners because of its bright red berries, with Florida growers reported yearly sales of over \$100,000 in 2004 (Wirth et al., 2004). However, coral berry has many "invasive" qualities, such as vigorous coppicing, high germination rate with little evidence of complicated germination requirements, bird and small animal dispersal, and an ability to grow densely and form thickets. Even more worrisome, however, is that cultivars introduced into the United States may be more invasive and damaging than the wild type due to selection by horticulturalists for a fuller plant canopy, more fruit, and greater storage of carbohydrates in roots. As the plant is already invasive in several areas of Florida that are a climate match for the area, this plant should not be considered for sale in Georgia, and cultivars should also be well researched to see how they differ from the parent species, as many "selected for" attributes actually increase the likelihood of spread and growth of this plant. This PRE evaluation fairly represents the potential invasive risk of this plant in the region of concern.

General Information

Status: Completed

Screener: Kylie Bucalo

Evaluation Date: July 15, 2017

Plant Information

Plant: *Ardisia crenata*

Regional Information

Region Name: Georgia



Climate Matching Map

To answer four of the PRE questions for a regional evaluation, a climate map with three climate data layers (Precipitation, UN EcoZones, and Plant Hardiness) is needed. These maps were built using a toolkit created in collaboration with GreenInfo Network, USDA, PlantRight, California-Invasive Plant Council, and The Information Center for the Environment at UC Davis.

Click [here](#) to see the generated climate matching map for this region. This climate match database is hosted by GreenInfo Network and publicly accessible.



Evaluation Questions

These questions are based in an original article published at the University of California, Davis, and can be found on the PLOS One website, here: <https://doi.org/10.1371/journal.pone.0121053>

Invasive History and Climate Matching (Questions 1 - 6)

1. Has the species (or cultivar or variety, if applicable; applies to subsequent "species" questions) become naturalized where it is not native?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Used as an ornamental for its attractive berries, *Ardisia crenata* has been transported globally from its native range where it has escaped ornamental cultivation and plantings. CABI- It is one of the most invasive woody plant species in Mauritius where it has escaped into wet forests. CABI- In Australia it has become naturalised in remnant rainforest in NE New South Wales, and is also present in Queensland (Csurhes and Edwards, 1998). USDA resource- It has been introduced into the states of Georgia, Florida and Louisiana.

Reference(s):

- CABI (0). *Ardisia crenata* (coral berry)_CABI.
- USDA Plants Database (0). Plants Profile for *Ardisia crenata* (hen's eyes).

2. Is the species (or cultivar or variety) noted as being naturalized in the US or world in a similar climate?

- Answer: **Yes**, which contributes **2** points to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.



Answer / Justification:

Excerpt from CABI: "It has been reported in Florida natural areas in Alachua, Flagler, Gadsden, Highlands, Hillsborough, Leon, Liberty, Marion, Martin, and Orange counties (Langeland and Burks, 1998). It has spread from Florida into other southern states, including to Texas in 1997 (Niu et al., 2012)." Florida is a climate match, as is east Texas. In Georgia, *Ardisia crenata* is designated a category 2 plant by the GAEPCC which is described as "A moderate exotic plant problem in Georgia natural areas, invading native plant communities and displacing native species, but to a lesser degree than Category 1 species." MOBOT- "naturalized in parts of Florida, Georgia, Louisiana, Texas and the Hawaiian Islands."

Reference(s):

- CABI (0). *Ardisia crenata* (coral berry)_CABI.
 - USDA Plants Database (0). Plants Profile for *Ardisia crenata* (hen's eyes).
 - Georgia Invasive Species Task Force (0). List of Non-native Invasive Plants in Georgia - Georgia Invasive Species Task Force- LIST.
 - Missouri Botanical Garden PlantFinder (0). *Ardisia crenata* - Plant Finder_MOBOT.
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3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

- Answer: **Yes**, which contributes **2** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Summary of invasiveness from CABI: "In the USA it is listed as weedy or invasive in Florida and Hawai'i by the USDA (USDA-NRCS, 2013), and considered to be invasive by the Florida Exotic Pest Plant Council (Sellers et al., 2013) as well as being on the Florida noxious weed list (Center for Aquatic and Invasive Plants, 2013), with planting prohibited in Miami-Dade County, Florida (PIER, 2013). It is also listed as a Category 2 exotic plant that is a moderate problem in Georgia (Georgia Exotic Pest Plant Council, 2013), and is on 'Watch List A: recently appearing in Alabama as free-living infestations' (Alabama Invasive Plant Council, 2007). A risk assessment for *A. crenata* in Hawai'i produced a score of 10, which is a high risk value for invasive species (PIER, 2013). *A. crenata* is also listed as a priority species for exclusion from Niue (Space et al., 2004), and as invasive and of environmental concern in the Cook Islands and Fiji (Space and Flynn, 2002a); within the Cook Islands it is recommended for eradication on Rarotonga, and should be subject to inter-island quarantine between the southern Cook Islands (Space and Flynn, 2002b). In Australia, *A. crenata* is listed an 'emerging invader' and is a category 1 species in the Conservation of Agricultural Resources Act, which means it is a prohibited weed that must be controlled in all situations (Nel et al., 2004); it has also been nominated as a 'potential environmental weed' in Australia (Csurhes and Edwards, 1998)."



Reference(s):

- CABI (0). *Ardisia crenata* (coral berry)_CABI.
 - UF/IFAS Center for Aquatic and Invasive Plants (0). *Ardisia crenata* – UF/IFAS Center for Aquatic and Invasive Plants.
 - USDA Plants Database (0). Plants Profile for *Ardisia crenata* (hen's eyes).
 - UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assesment.
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4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- Answer: **Yes**, which contributes **3** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Ardisia crenata is listed on the Florida noxious weed list, listed as a category 1 species by the Florida Exotic Pest Plant Council, and a category 2 species by the GAEPPC.

Reference(s):

- CABI (0). *Ardisia crenata* (coral berry)_CABI.
 - UF/IFAS Center for Aquatic and Invasive Plants (0). *Ardisia crenata* – UF/IFAS Center for Aquatic and Invasive Plants.
 - UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assesment.
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5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.



Answer / Justification:

Ardisia elliptica is also on the Florida Noxious weed list, and a category 1 plant designated by FLEPPC and is described as "significant weed due to its rapid spread, dense stands, and impact on native species diversity".

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (0). *Ardisia elliptica* – UF/IFAS Center for Aquatic and Invasive Plants.
 - UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assesment.
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6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Ardisia crenata's distribution in the US is greater than a 50% match, as most occurrences are found in Florida. Australia's distribution is just about a 50% match, there is a cluster in northern Queensland that is not a match but occurrences in New South Wales that hug the eastern coastline are a match. Taiwan, which has a dense population of *A.crenata*, is not a climate match. Japan's distribution is not a match, Malaysia is not a match, China is not a match. I would still answer no to the question as the occurrences are fewer in the areas that are a match (US and Australia) so I think it falls below the 50% majority.

Reference(s):

- GBIF (0). *Ardisia crenata* Sims_GBIF.
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Impact on Native Plants and Animals (Questions 7 - 10)

7. Does this plant displace native plants and dominate (overtop or smother) the plant community in areas where it has established?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Does not smother or cover like a vine, rather displaces by outshading native seedlings and understory plants.

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (0). *Ardisia crenata* – UF/IFAS Center for Aquatic and Invasive Plants.
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8. Is the plant noted as promoting fire and/or changing fire regimes?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

No evidence of this however *Ardisia* is capable of resprouting after cutting back or after a fire. Very tolerant of above ground tissue damage (Dozier, 1999) and resprouts vigorously after cutting and fire.

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (0). *Ardisia crenata* – UF/IFAS Center for Aquatic and Invasive Plants.
 - UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assesment.
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9. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

No evidence of this.

Reference(s):

- [Anonymous] .
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10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

CABI "A. crenata invades the understory of mesic hardwood forests forming dense patches (up to 300 stems per m²), and competitively displaces native plants through shading (Kitajima et al., 200)". CABI- "In Mauritius, Lorence and Sussman (1986) report that dense thickets of A. crenata are likely to displace native forest species in time,". WRA- "Forms dense thickets in wet forests in Mauritius; average density is 21 seedlings per square meter (Lorence and Sussman, 1986). May reach densities of 100 plants per square meter (Langeland and Burks, 1998). Up to 300 stems per square meter (Kitajima et al. 2006)."

Reference(s):

- CABI (0). *Ardisia crenata* (coral berry)_CABI.
 - UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assesment.
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Reproductive Strategies (Questions 11 - 17)

11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

From WRA- "Very tolerant of aboveground tissue damage (Dozier, 1999) and resprouts vigorously after cutting and fire (Langeland and Burks, 1998). "An unfortunate and unintended consequence of the high resprouting ability of the Florida ecotype is the difficulty of eradication; *A. crenata* recovers easily from repeated mowing and above-ground removal by resprouting from the stem base within a year (KK unpublished data)" (Kitajima et al., 2006). "

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assesment.
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12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of this.

Reference(s):

- [Anonymous] .
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13. Does the species (or cultivar or variety) commonly produce viable seed?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **Very High** confidence in this answer based on the available literature.

Reference(s):

- CABI (0). *Ardisia crenata* (coral berry)_CABI.
 - Missouri Botanical Garden PlantFinder (0). *Ardisia crenata* - Plant Finder_MOBOT.
 - UF/IFAS Center for Aquatic and Invasive Plants (0). *Ardisia crenata* – UF/IFAS Center for Aquatic and Invasive Plants.
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14. Does this plant produce copious viable seeds each year (> 1000)?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

WRA- Healthy adult plants produce between 30-225 fruit per plant with a mean of 129 fruit. Important to note that the berries are attractive to ornamental horticulturalists, which has resulted in an artificial selection for enhanced berry production trait, which will increase the risk of invasiveness in some cultivars.

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assesment.
 - CABI (0). *Ardisia crenata* (coral berry)_CABI.
-



15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

MOBOT- "High seed germination rate often translates into a weedy (sometimes invasive) spread of this plant, particularly into mesic forest areas where an undesired reduction in native species begins to occur." from CABI- "Seed germination is controlled by several environmental factors such as seed moisture content, temperature, and light; removal of the seed coat increases germination rates." Most of these "requirements" seem pretty normal and do not seem unusual. CABI- "There is no evidence of *A. crenata* forming a soil seed bank, but seeds are able to survive up to two years in moist conditions at temperatures (e.g. 3°C) which are too cold for germination. In conditions suitable for germination, *A. crenata* has a high germination rate (>90% in one study), but also relatively high rates of seedling mortality (Fox and Kitajima, 2001)."

Reference(s):

- CABI (0). *Ardisia crenata* (coral berry)_CABI.
 - Missouri Botanical Garden PlantFinder (0). *Ardisia crenata* - Plant Finder_MOBOT.
-

16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Produces seed within 2 years

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assesment.



17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

CABI- "Plants can produce around 150 fruits per year (Fox and Kitajima, 2001), which have a long period of development (34 weeks) and remain attached for a long time (Lee et al., 2012)". MOBOT resource indicates fruits can stay on the tree year round until they fall off into the ground.

Reference(s):

- CABI (0). *Ardisia crenata* (coral berry)_CABI.
 - Missouri Botanical Garden PlantFinder (0). *Ardisia crenata* - Plant Finder_MOBOT.
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Dispersal (Questions 18 - 20)

18. Are the plant's propagules frequently dispersed long distance (>100 m) by mammals or birds or via domestic animals?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Bird dispersed. from WRA- "Bird dispersed (Meisenburg, 2007; Space and Flynn, 2002; Staples et al., 2000). Dispersed by mockingbirds and cedar waxwings in Florida (Langeland and Burks, 1998)." Most likely birds, however raccoons and other small animals may also ingest and spread seed, though this is suggested as less likely than birds.

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (2013). *Ardisia crenata* _Weed Risk Assessment.



19. Are the plant's propagules frequently dispersed long distance (>100 m) by wind or water?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

no they are berries with no mechanism for this kind of dispersal.

Reference(s):

- [Anonymous] .
-

20. Are the plant's propagules frequently dispersed via contaminated seed (agriculture or wildflower packets), equipment, vehicles, boats or clothing/shoes?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screeener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of this

Reference(s):

- [Anonymous] .
-



Total PRE Score

PRE Score: 16 -- Reject (high risk of invasiveness)

Confidence: 76 / 100

Questions answered: 20 of 20 -- Valid (80% or more questions answered)

PRE Score Legend

The PRE Score is calculated by adding the point totals for each (answered) question.

< 13 : accept (low risk of invasiveness)

13 - 15 : evaluate further

> 15 : reject (high risk of invasiveness)

Questions Answered Legend

It is important to answer at least 16 questions to consider a PRE Score as "valid".

≥ 16 : valid (80% or more questions answered)

≤ 15 : invalid (not enough questions answered)

Organization Ownership and Content Privacy

Organization: 2017 Farm Bill PRE Project

Content Privacy: Public



Evaluation Reviewers

The PRE approach is to base decisions on science and make decisions by consensus of diverse horticultural stakeholders. The literature review and process of answering PRE's questions are based on science; the decisions of which plants to prioritize are based on consensus. To ensure this process is in place and that PRE is collaborative, volunteer stakeholders are recruited from each region to review evaluations. The following experts in their profession (plant science, conservation, or horticultural trade) have participated as volunteer PRE reviewers for this evaluation:

- John "Doc" Ruter January 10, 2018
- Stewart Chandler December 18, 2017
- Eamonn Leonard December 7, 2017

This evaluation has a total of 3 reviewer(s).



Evaluation Issues

The following section lists all public issues for this evaluation. Issues provide a way for stakeholder reviewers to communicate any concerns or suggestions they might have with the plant or evaluation. Please email PlantRight@suscon.org if additional action is required to resolve open issues.

There are currently no issues associated with this evaluation.



About PRE and this Plant Evaluation Report

The PlantRight Plant Risk Evaluator -- PRE is an online database and platform enabling those involved in non-native, terrestrial plant production to know before they grow if a plant poses a regional invasive risk. This tool offers many benefits, and we encourage you to visit the PRE website (<https://pre.ice.ucdavis.edu>) for more information.

If you are a nursery trade association, or involved in the research, development or distribution of horticultural plants we invite you to join the PRE community. If you are a plant scientist, affiliated with a horticultural college or botanic garden, and would like to learn more about becoming a PRE Screener, please drop us an email, PlantRight@suscon.org, requesting a PRE Account.

PRE beta funding is provided by Sustainable Conservation (<http://www.suscon.org/>) and a USDA Farm Bill grant.