Fishgrass (*Cabomba haynesii*)
Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, March 2021
Revised, March 2021
Web Version, 7/30/2021

Organism Type: Plant
Overall Risk Assessment Category: Uncertain

Photo: O.M. Montiel. Licensed under CC BY-NC-ND. Available: http://legacy.tropicos.org/Image/100390633. (3/29/2021).

1 Native Range and Status in the United States

Native Range

From POWO (2021):

"Native to: Brazil West-Central, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Honduras, Jamaica, Nicaragua, Panamá, Puerto Rico, Trinidad-Tobago, Venezuela"

Cabomba haynesii is also native to Florida and Puerto Rico according to the USDA (2021).

Status in the United States

Cabomba haynesii is native to Florida and Puerto Rico according to the USDA (2021).

No data on trade for *Cabomba haynesii* could be found.

Means of Introductions in the United States

Cabomba haynesii has not been reported as introduced outside of its native range within the United States.

Remarks

From Flora do Brasil (2021):

"*Cabomba haynesii* Wiersema has been for a long time erroneously identified in Brazil as *C. caroliniana* A.Gray or as *C. furcata* Schult. & Schult.f., especially due to the coloration of its perianth. Nevertheless, it can be easily differentiated from *C. caroliniana* by the coloration of its stems, the number of stamens and ornamentation of the seeds. Furthermore, it can be easily differentiated from *C. furcata* by the indumentum in its vegetative organs, phyllotaxy, the shape of the filaments and anthers, and ornamentation of the seeds."

"has as a synonym heterotypic *Cabomba piauhyensis* form. *albida* Fassett"

There is conflicting information on whether *Cabomba haynesii* is native to the United States. NatureServe (2021) has *Cabomba haynesii* listed as "Exotic" however, USDA (2021) lists *Cabomba haynesii* as "Native" to Florida.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From World Flora Online (2021):

"This name [*Cabomba haynesii*] is reported by Cabombaceae as an accepted name in the genus *Cabomba* (family Cabombaceae)."

From ITIS (2021):

Kingdom Plantae
Subkingdom Viridiplantae
Infrakingdom Streptophyta
Superdivision Embryophyta
Division Tracheophyta
Subdivision Spermatophytina
Class Magnolipsida
Superorder Nymphaenae
Order Nymphaeles
Family Cabombaceae

Genus *Cabomba*
Species *Cabomba haynesii* Wiersema

Size, Weight, and Age Range
No information available.

Environment
From World Flora Online (2021):

"Common in stagnant or slow waters, sometimes slightly brackish, mainly in the Atlantic zone (…) [Translated from spanish]"

Climate
No information available.

Distribution Outside the United States
Native
From POWO (2021):

"Native to: Brazil West-Central, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Honduras, Jamaica, Nicaragua, Panamá, Puerto Rico, Trinidad-Tobago, Venezuela"

Introduced
Cabomba haynesii has not been reported as introduced or established outside of its native range.

Means of Introduction Outside the United States
Cabomba haynesii has not been reported as introduced or established outside of its native range.

Short Description
From Flora do Brasil (2021):

"Stems olive-green to reddish, with reddish striations, pilose, nodes with red papillae, 2 vascular bundles in cross section all along the stem. Leaves decussate, petiole 7–9 mm long, glabrous, lamina depressed-obovate in outline, 2.3–3.5 × 4.4–6.8 cm, green to reddish, glabrous, primary branches plane, 5, terminal segments linear to oblong, apex variously dentate. Bracteoles with petiole 0.9–2.1 cm long, green, pilose, lamina 5.2–25 × 0.4–1 mm, linear to narrowly-elliptic to trullate to sagittate, green. Flowers 1–1.3 cm wide, 3-merous; flower buds 0.6–1 cm long; pedicel 3.3–3.6 cm long; sepals basal third bright yellow, margins concolorous, apex white to pinkish to pale-lilac, 0.3–1 × 0.1–0.4 cm, oblong to elliptic, apex rounded; petals basal third bright yellow, apex apex white to pinkish to pale-lilac 0.3–1.1 × 0.1–0.3 mm, elliptic to spatulate, apex rounded, base auriculate; stamens (3–)5, filaments 3–4 mm long, straight, anthers 1.6–1.8 × 0.8–1 mm, oblong; pollen striate; carpels (1–)2, 3–4 × 0.7–1 mm. Achenes 8–9 × 2.5–2.9 mm. Seeds oblongoid to ovoid, 1.8–2.5 × 1–2 mm, testa tuberculate, generally with longer papillae at the base of the seed; embryotega conspicuous."

Biology
From World Flora Online (2021):

"Common in stagnant or slow waters, sometimes slightly brackish, mainly in the Atlantic zone […]"

Human Uses
No actual or potential uses are reported for *Cabomba haynesii.*

Diseases
No diseases have been reported for *Cabomba haynesii.*

Threat to Humans
No threats to humans have been reported for *Cabomba haynesii.*

3 Impacts of Introductions
C. haynesii has not been reported as introduced outside of its native range; therefore, impacts of introductions are unknown. *C. haynesii* is listed as a prohibited invasive species in Queensland, Australia (DAF 2021), likely due to introductions and impacts from other members of the *Cabomba* genus.

4 History of Invasiveness
C. haynesii has not been reported as introduced outside of its native range; therefore, impacts of introductions are unknown. *C. haynesii* is listed as a prohibited invasive species in Queensland, Australia (DAF 2021) likely due to other introductions and impacts from other members of the *Cabomba* genus. The history of invasiveness is classified as No Known Nonnative Population.

5 Global Distribution

Figure 1. Known global distribution of *Cabomba haynesii*. Observations are reported from Mexico, Cuba, Puerto Rico, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Peru, and Brazil. Map from GBIF Secretariat (2021). The observations in Mexico and Peru were not used to select source points for the climate match. The presence of the species in these countries was not corroborated by other sources.

6 Distribution Within the United States

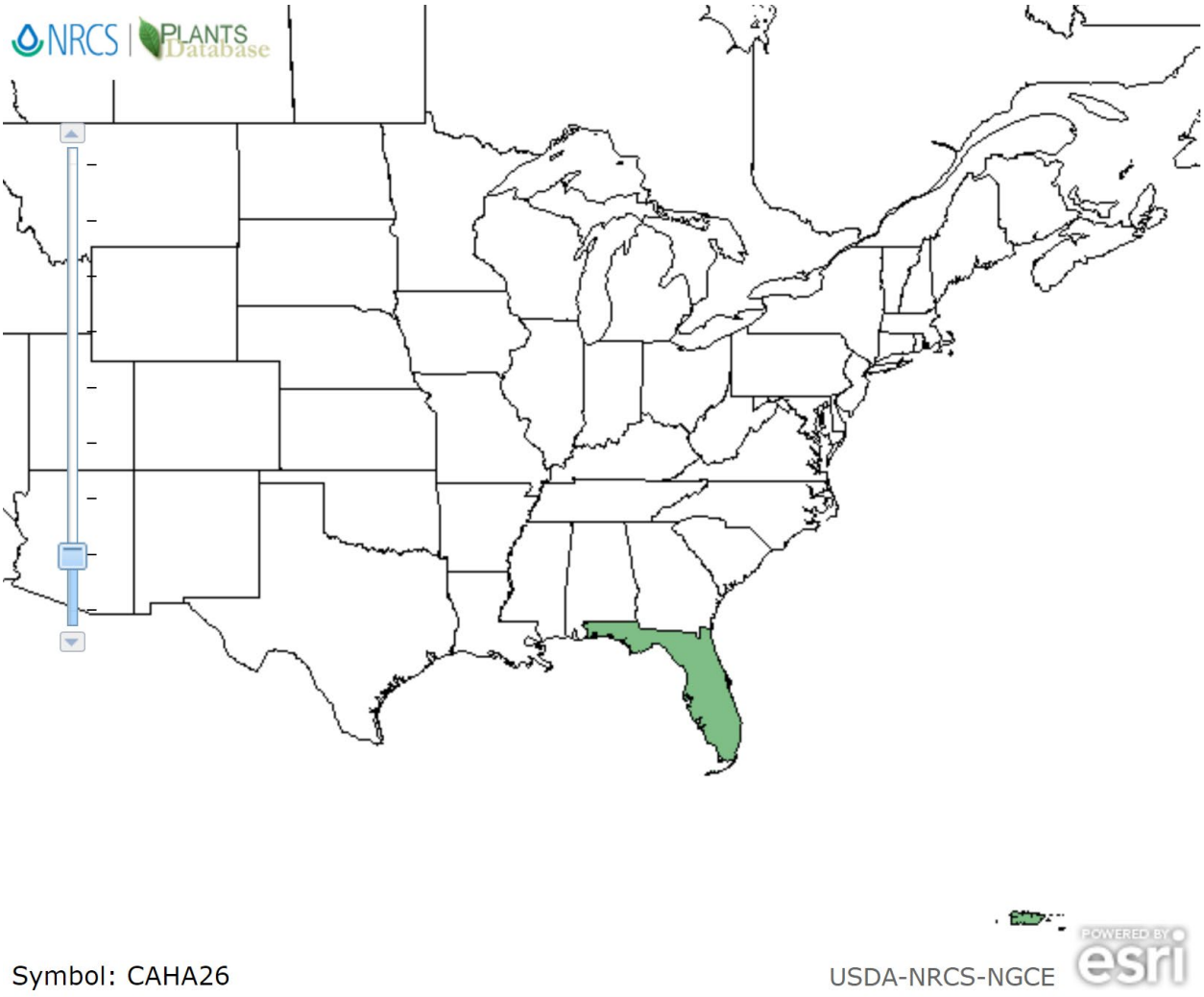

Figure 2. Known distribution of *Cabomba haynesii* in the United States. Map from USDA (2021). Areas in green denote locales where *C. haynesii* is native (Florida, Puerto Rico).

No georeferenced observations of *C. haynesii* in Florida were available to use in selecting source points for the climate match.

7 Climate Matching

Summary of Climate Matching Analysis

Most of the contiguous United States had a low climate match. Medium match was found in southern California, along the Gulf Coast, and the southern Atlantic Coast. High match was only found in peninsular Florida, where the species is present. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.012, Medium. (Scores between 0.005 and 0.103, exclusive, are categorized as Medium.) All States had low individual Climate 6 scores except for Florida and Texas, which had a high and medium individual Climate 6 score, respectively.

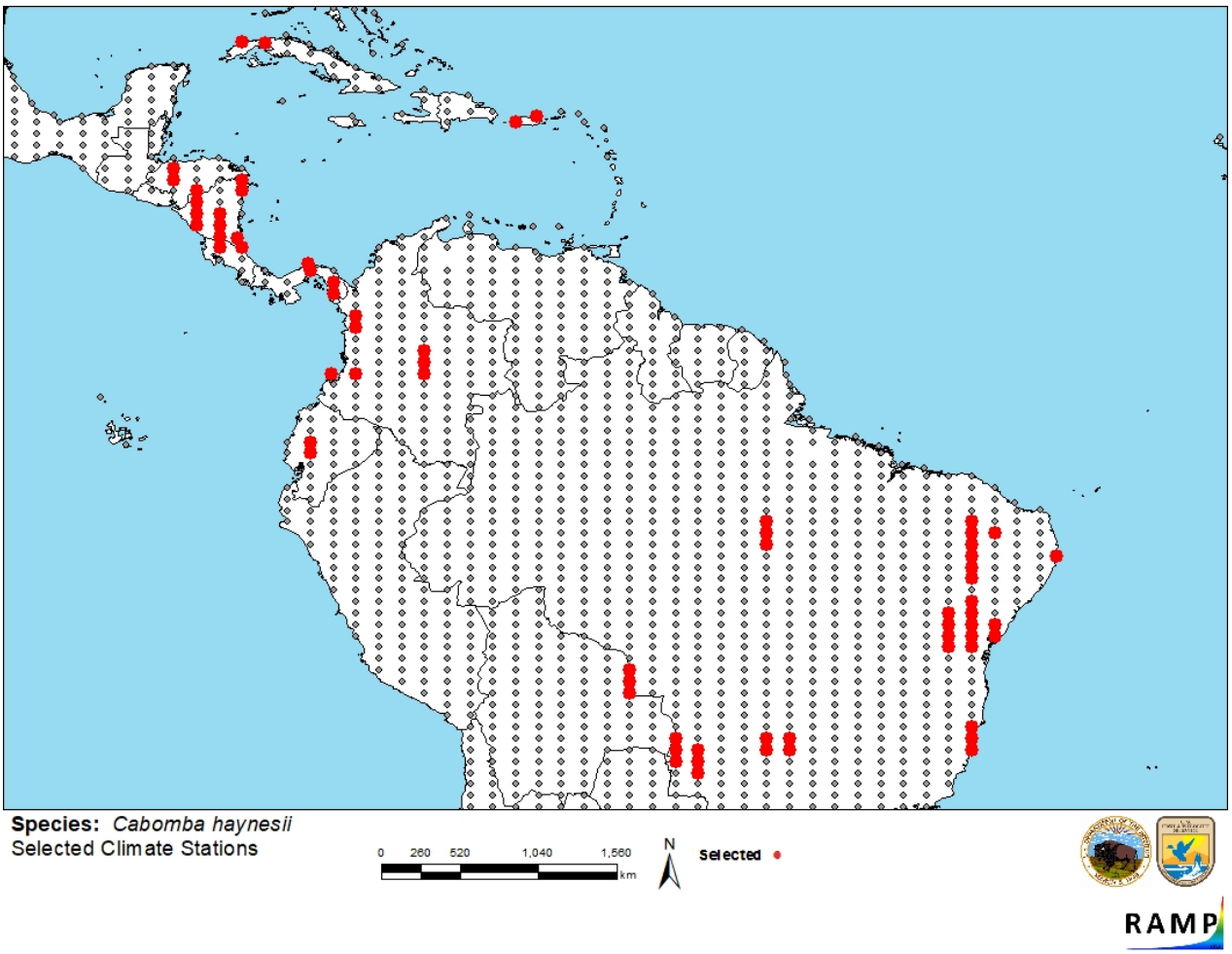

Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in Central and South America selected as source locations (red; Cuba, Puerto Rico, Honduras, Nicaragua, Panama, Colombia, Ecuador, Bolivia, and Brazil) and non-source locations (gray) for *Cabomba haynesii* climate matching. Source locations from GBIF Secretariat (2021). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

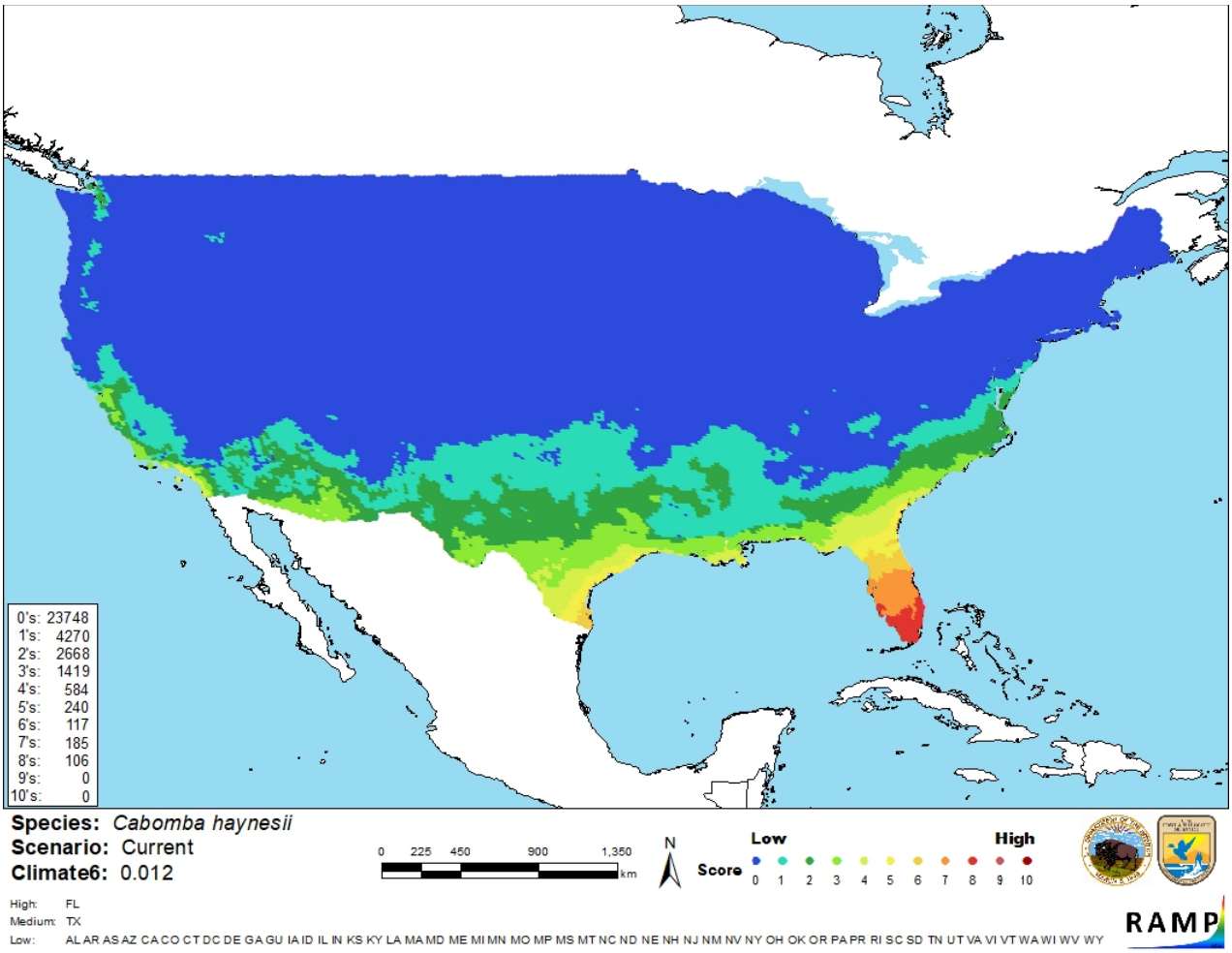

Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Cabomba haynesii* in the contiguous United States based on source locations reported by GBIF Secretariat (2021). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
0.000≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

8 Certainty of Assessment

Cabomba haynesii has not been recorded outside of its native range and impacts of introductions are unknown. There is contradictory information with regards to this species native range and it has been confused with other species in the genus in parts of its range. Similarly, information concerning this species' biology is very limited. The certainty of this assessment and the

interpretation of the climate matching analysis is low due to an overall lack of information pertaining to *C. haynesii*.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Cabomba haynesii, Fishgrass, is an aquatic plant that is native to South America, Central America, and the Caribbean, including Puerto Rico. There is conflicting information about whether this species is native to Florida. There are no reports of introductions. *C. haynesii* is classified as a prohibited invasive plant in Queensland, Australia. History of invasiveness is classified as No Known Nonnative Population. Information about this species' native range is limited and contradictory, reducing the certainty of this screening and the certainty of the interpretation of the climate match. The climate match for the contiguous United States is Medium, with some medium match in Southeastern coastal areas and southern California. Peninsular Florida, where the species is present, was dominated by a high climate match. The rest of the contiguous United States had low match. The overall risk assessment category is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): Medium**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information: No additional remarks**
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

Flora do Brasil. 2021. Jardim Botanico do Rio de Janerio. *Cabombaceae.* Available: http://reflora.jbrj.gov.br/reflora/listaBrasil/FichaPublicaTaxonUC/FichaPublicaTaxonUC.do?id=FB34569 (March 2021).

GBIF Secretariat. 2021. GBIF backbone taxonomy: *Cabomba haynesii* Wiersema. Copenhagen: Global Biodiversity Information Facility. Available: https://www.gbif.org/species/2882444 (March 2021).

[ITIS] Integrated Taxonomic Information System. 2021. *Cabomba haynesii* Wiersema. Reston, Virginia: Integrated Taxonomic Information System. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=501098#null (March 2021).

NatureServe. 2021. NatureServe Explorer: an online encyclopedia of life, version 2.0. Arlington, Virginia: NatureServe. Available: http://explorer.natureserve.org (March 2021).

POWO. 2021. Plants of the World Online. Royal Botanic Gardens, Kew science. Available: https:\\www.plantsoftheworldonline.org (March 2021).

[DAF] Queensland Department of Agriculture and Fisheries. 2020. Prohibited invasive plants of Queensland. Queensland, Australia.

Sanders S, Castiglione C, Hoff M. 2018. Risk Assessment Mapping Program: RAMP. Version 3.1. U.S. Fish and Wildlife Service.

USDA, NRCS. 2021. *Cabomba haynesii* Wiersema fishgrass. The PLANTS database. Greensboro, North Carolina: National Plant Data Team. Available: https://plants.sc.egov.usda.gov/core/profile?symbol=CAHA26 (March 2021).

World Flora Online. 2021. *Cabomba haynesii* Wiersema. World Flora Online – a project of the World Flora Online Consortium. Available: http://www.worldfloraonline.org/taxon/wfo-0000705668 (March 2021).

11 Literature Cited in Quoted Material

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

No references for this section.