U.S. Fish & Wildlife Service

Umbrella Sedge (*Cyperus albostriatus*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, March 2023
Revised, May 2023
Web Version, 3/15/2024

Organism Type: Flowering Plant
Overall Risk Assessment Category: Uncertain

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1 Native Range and Status in the United States

Native Range

From POWO (2023):

"Native to: Botswana, Cape Provinces, Lesotho, Mozambique, Namibia, Northern Provinces, Swaziland, Zambia, Zimbabwe"

From WFO (2023):

“Cape Peninsula and Uitenhage to northern SA [South Africa] and just to tropical Africa.”

Status in the United States

From Wunderlin et al. (2023):

“Locality: USA. Florida. Hillsborough Co.: Near a parking lot on the SW corner of the intersection of Dale Mabry Highway and Ehrlich Road/West Bearss Avenue. 28º 5’ 1” N 82º 30’ 20” W”

“Locality: USA. Florida. Alachua Co.: Lake Alice, University of Florida campus, Gainesville. 29º 38’ 27” N 82º 21’ 36” W
Description: Rhizomatous colony ca. 30 m², unclear if spreading by seed.”

From Rosen et al. (2012):

“During routine field work in 2004 [in Texas], the first author vouchered an unknown *Cyperus*, determined it as *C. diffusus* Vahl, and sent it to Richard Carter for confirmation. The plant was subsequently determined to be the similar species, *Cyperus albostriatus* Schrad. […]
C. albostriatus has not previously been reported from North America (cf., Tucker et al. 2002).”

“Voucher specimen: USA. Texas. Harris Co.: Houston, in the floodplain of White Oak Bayou, about 0.6 mi SW of the intersection of Hwy. 610 and Ella Blvd., a local green-space known as Little Thicket Park […] well established in shaded mesic slopes with *Carpinus, Prunus, Acer, Populus, Fraxinus,* and *Ulmus*, N29°48'24.0" W95°25'53.8 […].”

This species is in trade in the United States (e.g., Glasshouse Works 2023).

Regulations

No species-specific regulations on possession or trade were found within the United States.

Means of Introductions within the United States

From Rosen et al. (2012):

“[…] abundant rhizomatous herb apparently escaping from cultivation […].”

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From GBIF Secretariat (2022):

Kingdom Plantae
Phylum Tracheophyta
Class Liliopsida
Order Poales
Family Cyperaceae
Genus *Cyperus*
Species *Cyperus albostriatus*

According to WFO (2023), *Cyperus albostriatus* is the current valid name for this species.

Size, Weight, and Age Range

From Gilman (1999):

"Height: .5 to 1 feet
Spread: 1 to 2 feet"

From WFO (2023):

"Tufted perennial, 20-50 cm."

Environment

From Gilman (1999; environmental parameters for cultivation of *Cyperus albostriatus*):

"Light requirement: plant grows in part shade/part sun
Soil tolerances: slightly alkaline; clay; sand; acidic; extended flooding; loam;
Drought tolerance: moderate
Soil salt tolerances: poor"

Climate

From Gullón and Verloove (2015):

"[…] frequently cultivated as an ornamental in warm-temperate regions of the world, […] (WALTERS, 1984: 116; GLEN, 2002: 32)."

Distribution Outside the United States

Native

From POWO (2023):

"Native to: Botswana, Cape Provinces, Lesotho, Mozambique, Namibia, Northern Provinces, Swaziland, Zambia, Zimbabwe"

From WFO (2023):

"Cape Peninsula and Uitenhage to northern SA [South Africa] and just to tropical Africa."

Introduced

From Gullón and Verloove (2015):

"To our knowledge it [*Cyperus albostriatus*] has not been recorded so far in the wild in Europe (e.g. VERLOOVE, 2014). In Huelva (Spain) *Cyperus albostriatus* was found in a highly disturbed habitat. At least for now, it is best considered an ephemeral alien (ergasiophygophyte) although a future naturalization cannot be ruled out."

From Rosen et al. (2012):

"It has been cited as a weed in Australia and New Zealand (Healy and Edgar 1980; Simpson and Inglis 2001; Bryson and Carter 2008)."

From Esler and Astridge (1987):

"Mrs P. Hynes working at the Auckland Museum [New Zealand], the Auckland Botanical Society, and members of the public collected many specimens which are a substantial contribution to the records of Auckland's alien flora. Species considered to have naturalised in the period 1940 to 1970 are: […] *Cyperus albostriatus*"

From POWO (2023):

"Introduced into: […] Norfolk Is., Spain, […] Vanuatu"

Means of Introduction Outside the United States

From Verloove (2014):

"The African *Cyperus albostriatus* Schrad. is widely cultivated as an ornamental and was recently recorded as an escape in southern Spain (E. Sánchez Gullón, August 2014 pers. comm.); a future naturalization in the Mediterranean area is very likely (see also Rosen et al. 2012)."

From Verloove (2023):

“An additional species, *Cyperus albostriatus* Schrad. (also native in Africa), is nowadays even more frequently cultivated, primarily in greenhouses [in Belgium]. […] It is likely to occur as a casual throw-out on dumps.”

From Rosen et al. (2012):

“[…] in New South Wales, Australia, it is frequently cultivated as an ornamental and has become naturalized (Wilson 1993).”

Short Description

From Hyde et al. (2023):

“Perennial sedge. Rhizome elongated, woody. Leaves basal, c. 15 mm wide. Inflorescence branched spreading; involucral bracts 3-4, spreading, up to 25 cm, linear. Spikelets 6 -12 × 1.5-4 mm, pinkish-white, 6-15-flowered. Glumes 4-5 mm, lanceolate with shortly excurrent midrib. Stamens 3. Stigmas 3. Nutlet 2-2.5 × 1.2-1.4 mm, obovoid, triangular, yellowish-brown to olive, minutely papillose.”

From Gilman (1999):

“The small, curving tufts of flower bracts look like leaves and radiate out from the top of the bare, slender, triangular stalks, like the ribs of an umbrella.”

From Rosen et al. (2012):

“Its slender elongate rhizomes, major veins of dried primary inflorescence bracts and leaves adaxially white banded, and floral scales with conspicuously ciliate margins readily distinguish it from other Texas *Cyperus*.”

From WFO (2023):

“Perennial herb, up to 300 mm tall. Leaves broad, 7-10 mm wide, grass-like, 3-nerved, flat. Solitary spikelets frequent in compound umbel. Glume margin sparsely fringed with short hairs, greenish brown.”

Biology

From Gilman (1999):

“Growth is moderate and Umbrella Sedge could eventually take over a small pond, spreading by seed and underground stems, […].”

From Wunderlin et al. (2023):

“Habitat: Edge of remnant cypress [*Taxodium*] swamp.”

“Habitat: Hydric hammock along marsh.”

From Rosen et al. (2012):

“Kükenthal (1935-1936) indicated *C. albostriatus* is widespread in southern Africa and described its habitat as swampy places, shores, and forests. According to Gordon-Gray (1995), *C. albostriatus* is "frequent in Natal in shaded, often rocky, not necessarily damp situations on margins of forest, in woodland and in plantations of exotics (pines, rarely eucalypts)," […].”

Human Uses

From Gullón and Verloove (2015):

“This *Cyperus* from South Africa is frequently cultivated as an ornamental in warm-temperate regions of the world, often under its vernacular name “Dwarf umbrella grass” (WALTERS, 1984: 116; GLEN, 2002: 32).”

This species is in trade in the United States (e.g., Glasshouse Works 2023).

Diseases

From Berndt and Wood (2012):

“This paper presents new species, combinations, national reports and host records for the South African rust fungi (Uredinales/Pucciniales). […] new records for South Africa: […] *Uromyces cypericola* and *Puccinia subcoronata*, both on a new host, *Cyperus albostriatus* (Cyperaceae).”

According to Poelen et al. (2014) *Cyperus albostriatus* can be the host to the following: *Puccinia morganae*.

Threat to Humans

No information was found on threats to humans for *Cyperus albostriatus*.

3 Impacts of Introductions

No information available on impacts of introductions for *Cyperus albostriatus*.

4 History of Invasiveness

The History of Invasiveness for *Cyperus albostriatus* is classified as Data Deficient. This species is widely cultivated as an ornamental, which is its likely means of introduction outside of its native range. Although multiple established nonnative populations of this species have been documented, no records of documented impacts of introduction were found.

5 Global Distribution

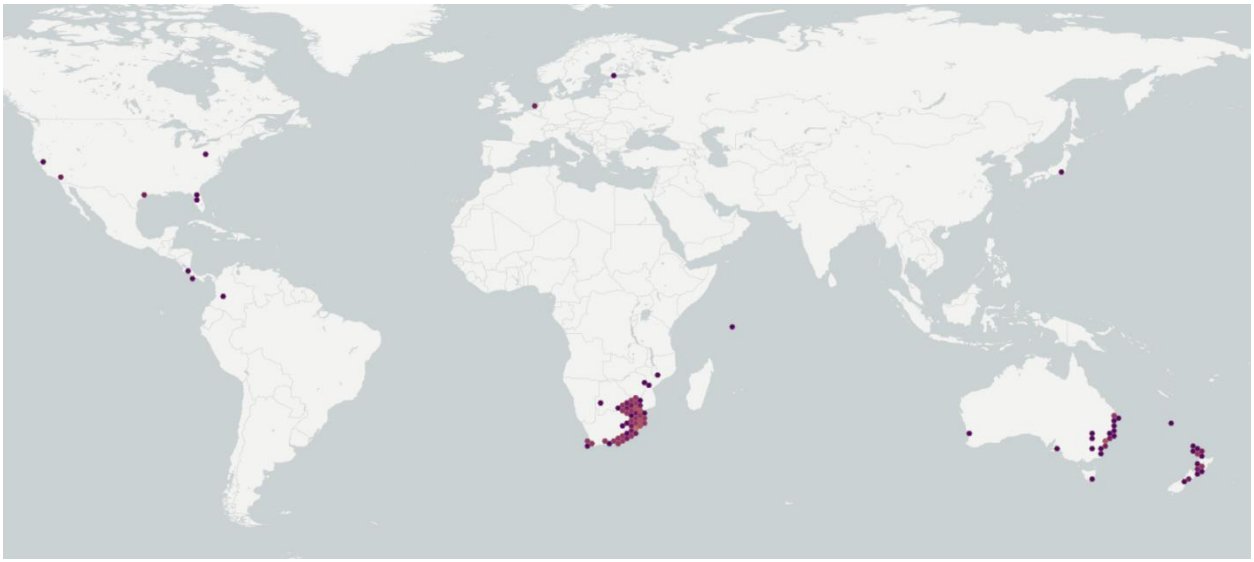

Figure 1. Reported global distribution of *Cyperus albostriatus*. Map from GBIF Secretariat (2022). Observations are reported from southern Africa, Seychelles, Australia, New Zealand, United States, Japan, the Netherlands, Finland, Costa Rica, Panama, and Colombia. Points located outside southern Africa, Australia, New Zealand, and the United States (Florida and Texas) were excluded from climate matching analysis because it could not be determined if they represent established wild populations of *C. albostriatus*.

Cyperus albostriatus is introduced in Spain (Gullón and Verloove 2015), but a specific location could not be determined and therefore points were not added into the climate matching analysis for those populations.

6 Distribution Within the United States

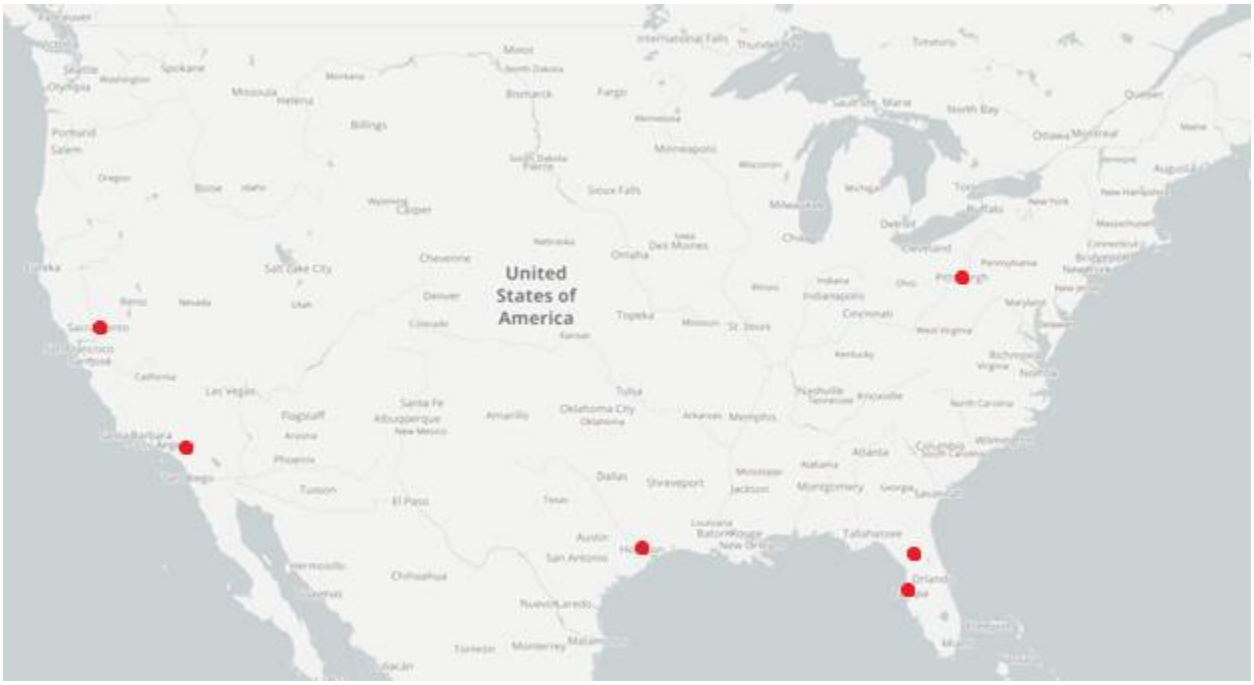

Figure 2. Reported distribution of *Cyperus albostriatus* in the United States. Map adapted from GBIF-US (2023). Observations are reported from California, Pennsylvania, Florida, and Texas. Points in California and Pennsylvania were excluded from climate matching because it could not be determined if they represented established wild populations of *C. albostriatus*.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Cyperus albostriatus* within the contiguous United States was highest in Florida and Texas, where the species is already present. There were areas of medium-high match in the South and along the West Coast, excluding the Pacific Northwest which had low matches. Much of the interior United States had a medium to medium-low Climate Match. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.659, indicating that Yes, there is establishment concern for this species. The Climate 6 score is calculated as: (count of target points with scores ≥ 6)/(count of all target points). Establishment concern is warranted for Climate 6 scores greater than or equal to 0.002 based on an analysis of the establishment success of 356 nonnative aquatic species introduced to the United States (USFWS 2024).

Projected climate matches in the contiguous United States under future climate scenarios are available for *Cyperus albostriatus* (see Appendix). These projected climate matches are provided as additional context for the reader; future climate scenarios are not factored into the Overall Risk Assessment Category.

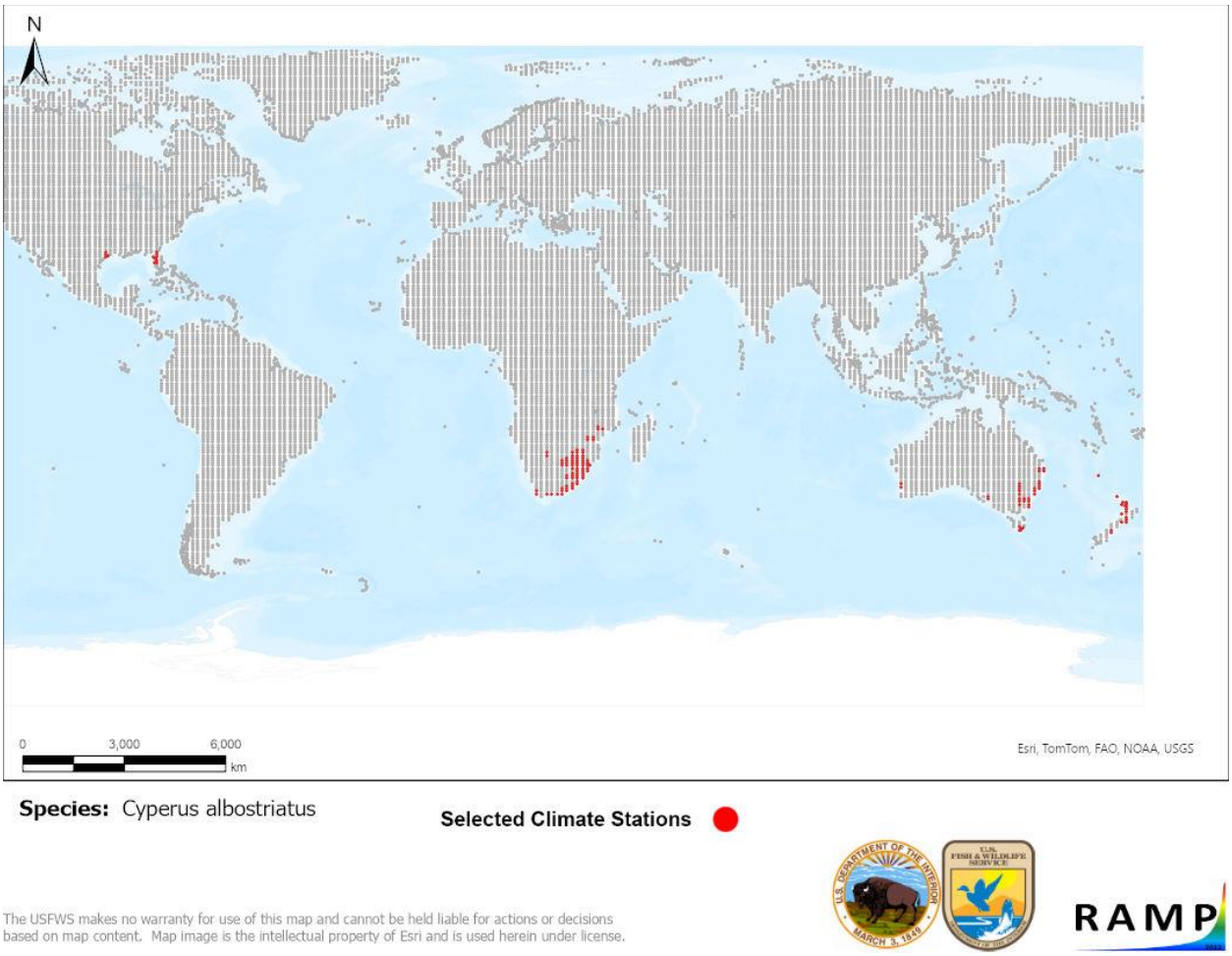

Figure 3. RAMP (Sanders et al. 2023) source map showing weather stations in Africa, Oceania, and North America selected as source locations (red; United States, Australia, New Zealand, South Africa, Lesotho, Eswatini, Mozambique, Botswana, Zimbabwe, Malawi) and non-source locations (gray) for *Cyperus albostriatus* climate matching. Source locations from GBIF Secretariat (2022). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

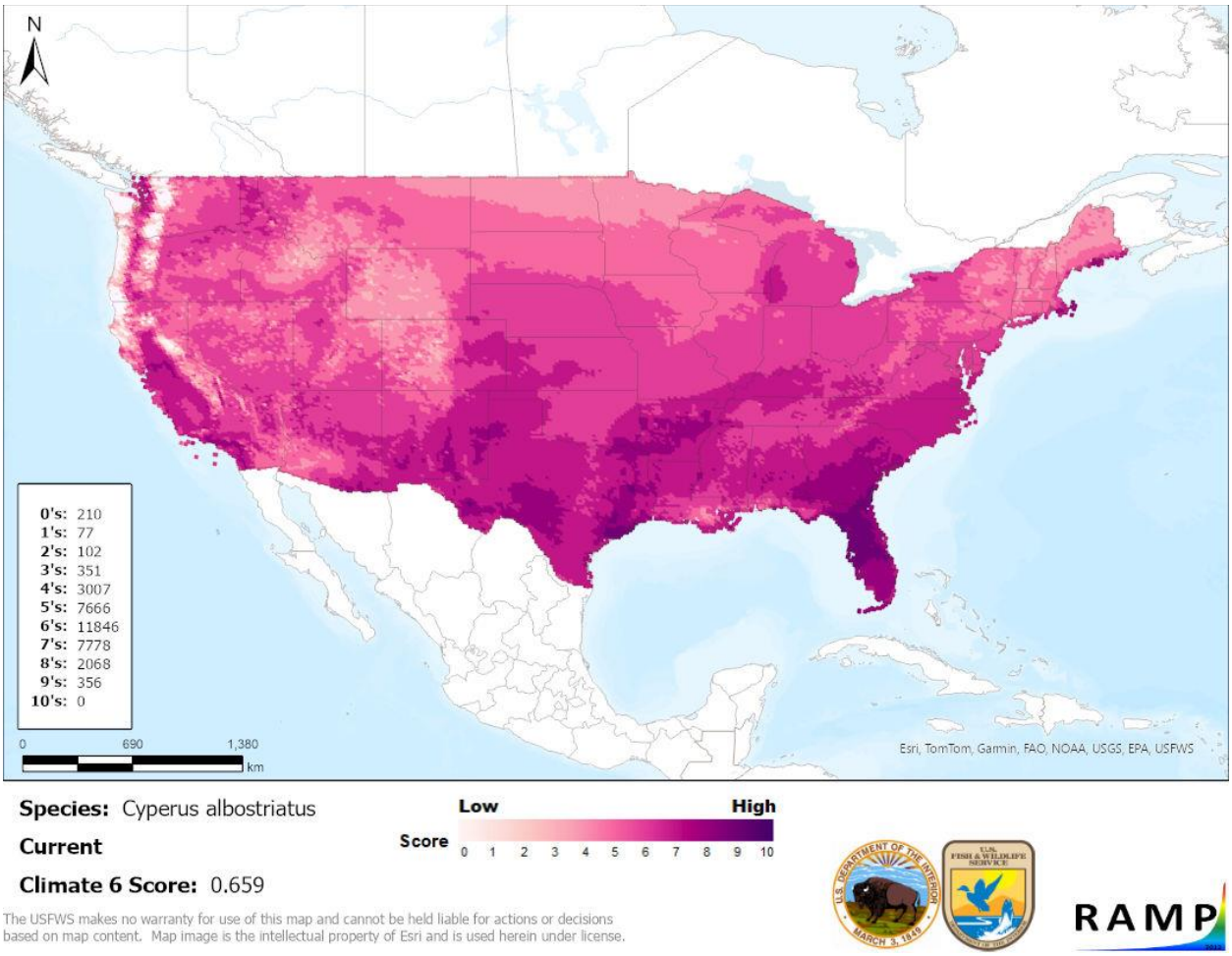

Figure 4. Map of RAMP (Sanders et al. 2023) climate matches for *Cyperus albostriatus* in the contiguous United States based on source locations reported by GBIF Secretariat (2022). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

8 Certainty of Assessment

The Certainty of Assessment for *Cyperus albostriatus* is classified as Low. There is information available about this species' biology and distribution. *C. albostriatus* has been reported as introduced outside of its native range; however, there is no information available on impacts of its introduction.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Cyperus albostriatus, Umbrella Sedge, is a plant that is native to southern Africa. *C. albostriatus* is cultivated as an ornamental plant and prefers swampy places, shores, and forests. It can spread through seeds and underground stems. The History of Invasiveness for *C. albostriatus* is classified as Data Deficient because although it has been documented as established outside of its native range in the United States, Oceania, and Europe, no information was available on impacts

of its introduction. The climate match analysis for the contiguous United States indicates establishment concern for this species. The climate match was highest in Florida and Texas, where the species is already present, and was also medium to high in most other areas of the contiguous United States. The northern Pacific Coast had areas of low match. The Certainty of Assessment for this ERSS is classified as Low due to a lack of information from which to assess impacts of the introductions. The Overall Risk Assessment Category for *C. albostriatus* in the contiguous United States is Uncertain.

Assessment Elements

- **History of Invasiveness (see section 4): Data Deficient**
- **Establishment Concern (see section 7): Yes**
- **Certainty of Assessment (see section 8): Low**
- **Remarks, Important additional information: None**
- **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.

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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.

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Appendix

Summary of Future Climate Matching Analysis

Future climate projections represent two Shared Socioeconomic Pathways (SSP) developed by the Intergovernmental Panel on Climate Change (IPCC 2021): SSP5, in which emissions triple by the end of the century; and SSP3, in which emissions double by the end of the century. Future climate matches were based on source locations reported by GBIF Secretariat (2022).

Under the future climate scenarios (figure A1), on average, high climate match for *Cyperus albostriatus* was projected to occur in the Southern Atlantic Coast region of the contiguous United States. Other areas of high match could be found in the southwest, although this area tended to decrease over time. The Climate 6 scores for the individual future scenario models (figure A2) ranged from a low of 0.464 (model: MPI-ESM1-2-HR, SSP5, 2085) to a high of 0.792 (model: GFDL-ESM4, SSP5, 2085). All future scenario Climate 6 scores were above the Establishment Concern threshold, indicating that Yes, there was an Establishment Concern for this species. The Climate 6 score for the current climate match (0.659, figure 4) falls within the range of scores for future projections. The time step and climate scenario with the most change relative to current conditions was SSP5, 2085 (figure A3). Under one or more time step and climate scenarios, areas within the Appalachian Range, Colorado Plateau, Great Lakes, Northeast, Northern Plains, and Western Mountains saw a moderate increase in the climate match relative to current conditions. No large increases were observed regardless of time step and climate scenarios. Under one or more time step and climate scenarios, areas within the Gulf Coast saw a large decrease in the climate match relative to current conditions. Additionally, areas within California, the Northern Pacific Coast, Southeast, Southern Atlantic Coast, Southern Florida, Southern Plains, Southwest, and Western Mountains saw a moderate decrease in the climate match relative to current conditions. The degree of change increased over time.

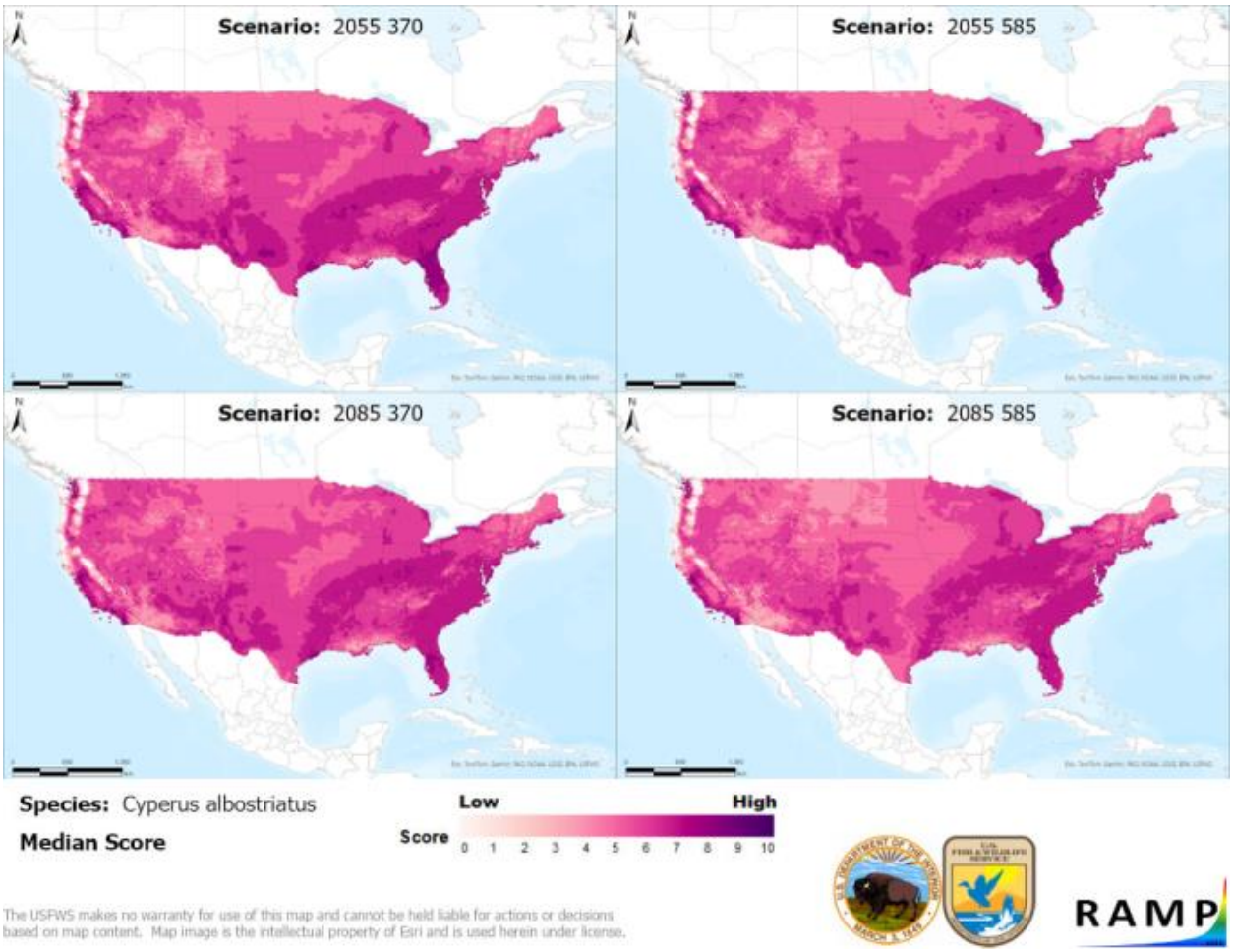

Figure A1. Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Cyperus albostriatus* in the contiguous United States. Climate matching is based on source locations reported by GBIF Secretariat (2022). Shared Socioeconomic Pathways (SSPs) used (from left to right): SSP3, SSP5 (IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global climate models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

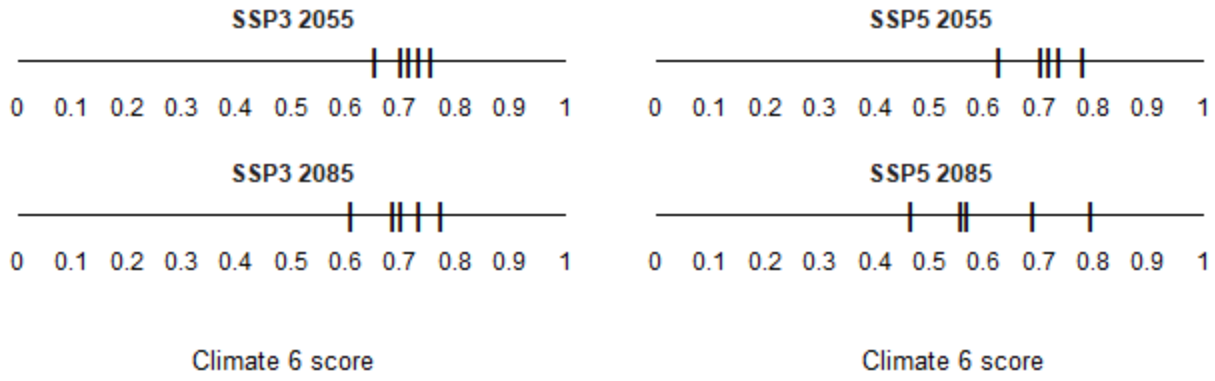

Figure A2. Comparison of projected future Climate 6 scores for *Cyperus albostriatus* in the contiguous United States for each of five global climate models under four combinations of Shared Socioeconomic Pathway (SSP) and time step. SSPs used (from left to right): SSP3, SSP5 (Karger et al. 2017, 2018; IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global climate models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0.

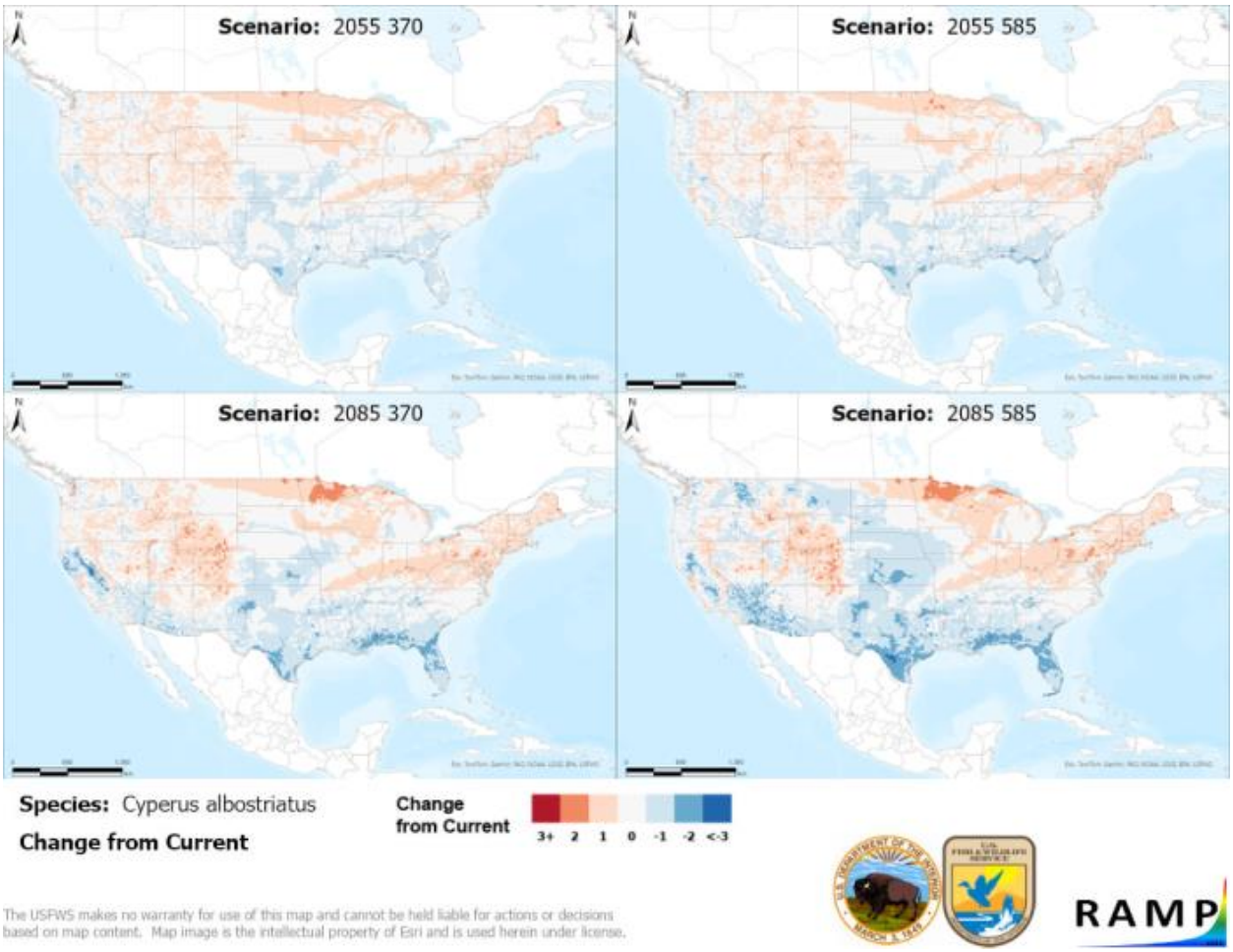

Figure A3. RAMP (Sanders et al. 2023) maps of the contiguous United States showing the difference between the current climate match target point score (figure 4) and the median target point score for future climate scenarios (figure A1) for *Cyperus albostriatus* based on source locations reported by GBIF Secretariat (2022). Shared Socioeconomic Pathways (SSPs) used (from left to right): SSP3, SSP5 (IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0. Shades of blue indicate a lower target point score under future scenarios than under current conditions. Shades of red indicate a higher target point score under future scenarios than under current conditions. Darker shades indicate greater change.

Literature Cited

GBIF Secretariat. 2022. GBIF backbone taxonomy: *Cyperus albostriatus* Schrad. Copenhagen: Global Biodiversity Information Facility. Available: https://www.gbif.org/species/2715443 (March 2023).

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