

# Vine Mesquite (*Hopia obtusa*)

## Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2023  
Revised, February 2023  
Web Version, 3/19/2024

Organism Type: Flowering Plant  
Overall Risk Assessment Category: Uncertain



Photos: Steve Jones. Licensed under CC BY-NC. Available: <https://inaturalist.nz/taxa/292065-Hopia-obtusa> (February 2023).

## 1 Native Range and Status in the United States

---

### Native Range

According to USDA, NRCS (2023), *Hopia obtusa* is native to Illinois, Arkansas, Missouri, Kansas, Oklahoma, Texas, Colorado, New Mexico, Arizona, and Utah, as well as Mexico.

### Status in the United States

According to USDA, NRCS (2023), *Hopia obtusa* occurs in Illinois, Arkansas, Missouri, Kansas, Oklahoma, Texas, Colorado, New Mexico, Arizona, and Utah.

There is evidence of *Hopia obtusa* being sold by private companies for agricultural purposes and as a useful plant to prevent soil erosion (e.g., Curtis and Curtis Seed 2019; Borderlands Restoration 2023).

## Regulations

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

## Means of Introductions within the United States

No records of nonnative populations of *Hopia obtusa* in the United States were found.

## Remarks

From Zuloaga (2007):

“The species [*Panicum obtusum*] is transferred to the new genus *Hopia* on the basis of morphological and molecular characters.”

# 2 Biology and Ecology

---

## Taxonomic Hierarchy and Taxonomic Standing

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

From ITIS (2023):

Kingdom Plantae

Subkingdom Viridiplantae

Infrakingdom Streptophyta

Superdivision Embryophyta

Division Tracheophyta

Subdivision Spermatophytina

Class Magnoliopsida

Superorder Lilianae

Order Poales

Family Poaceae

Genus *Hopia*

Species *Hopia obtusa* (Kunth) Zuloaga & Morrone

The following synonyms of *Hopia obtusa* from ITIS (2023) were used to search for information for this report: *Panicum obtusum*.

## Size, Weight, and Age Range

From USDA, NRCS (2023):

“The height ranges from 1-1/2 to 2-1/2 feet.”

## Environment

From Magee (2005):

“It grows mostly in small depressions or along drainageways where water accumulates. It grows best on sandy to sandy loam soils, but also grows on clay loams and gravelly loams.”

From Zuloaga et al. (2007):

“[...] between sea level and 2,850 m elevation.”

## Climate

No information was found on climate used by *Hopia obtusa*.

## Distribution Outside the United States

### Native

A portion of the species' native range is within the United States, see Section 1 for a full native range description.

USDA, NRCS (2023) lists *H. obtusa* as native to Mexico.

### Introduced

According to Pyšek et al. (2012), *H. obtusa* was reported in the Czech Republic in 1961. This occurrence was recorded in a single locality and has since vanished.

## Means of Introduction Outside the United States

According to Pyšek et al. (2012), *H. obtusa* was released accidentally in Czech Republic in 1961.

## Short Description

From Magee (2005):

“The leaf blade is long; narrow, upright, and smooth. The leaf sheath is mostly basal and one-half to three-fourths as long as the internodes. The stolon is several feet long with long internodes, the nodes swollen and covered with hair. The seedhead has a narrow panicle 1 to 4 inches long with the spikelets large, nearly round, and brownish.”

## Biology

From Magee (2005):

“[...] warm-season, stoloniferous perennial.”

“Growth starts in April or May. It produces seedheads in July and August. The seeds are slow to disseminate. It reproduces from both stolons and seed. It is often associated with other grasses, but grows in more or less pure stands.”

## Human Uses

There is evidence of *Hopia obtusa* being sold by private companies for agricultural purposes and as a useful plant to prevent soil erosion (e.g., Curtis and Curtis Seed 2019; Borderlands Restoration 2023).

From USDA, NRCS (2005):

“Grazing is the primary use of vine mesquite, but it has been cut for hay. It is used to control erosion in waterways and small gullies.”

## Diseases

No information was found on diseases associated with *Hopia obtusa*.

## Threat to Humans

No information was found on threats to humans from *Hopia obtusa*.

## 3 Impacts of Introductions

---

No information was found on impacts of introduction from *Hopia obtusa*.

No species-specific State regulations were found.

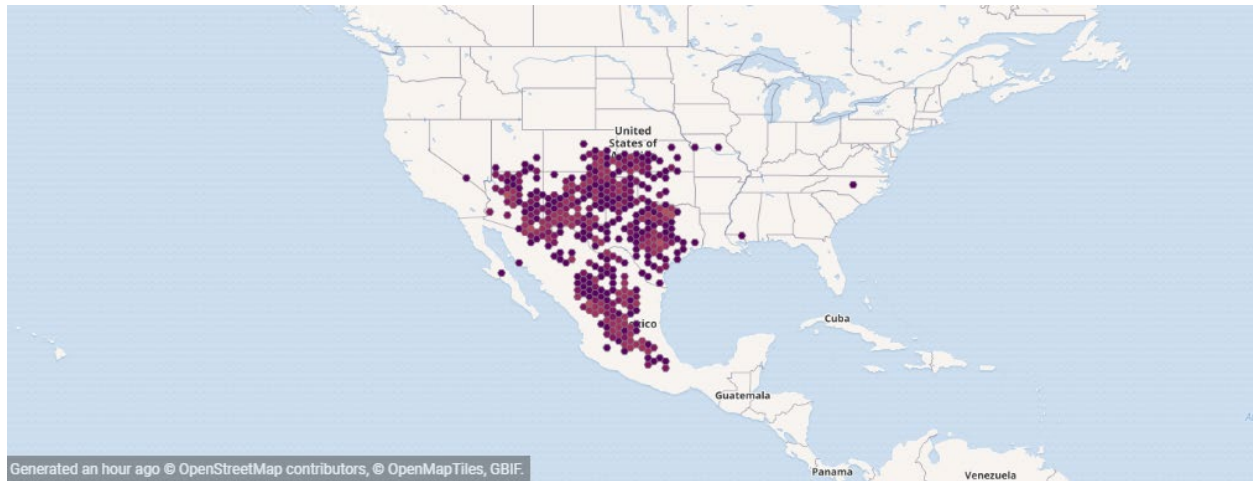
## 4 History of Invasiveness

---

*Hopia obtusa* has been reported as introduced in the Czech Republic. It was unclear if there was an established population, but the species has since vanished. This species is in trade in the United States but no information on volume or duration of that trade was available. Therefore, the History of Invasiveness for *Hopia obtusa* is classified as No Known Nonnative Population.

## 5 Global Distribution

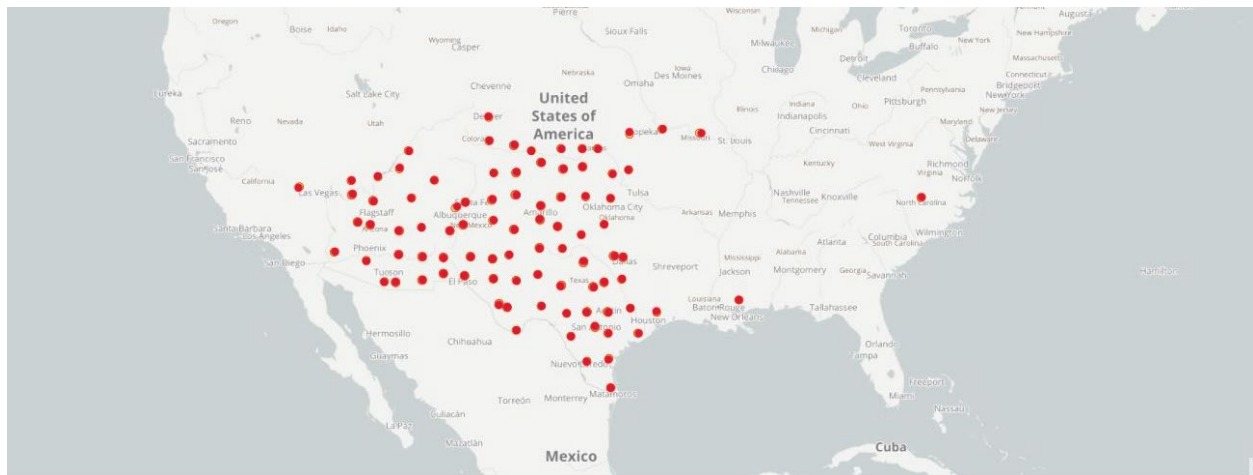
---



**Figure 1.** Reported global distribution of *Hopia obtusa*. Map from GBIF Secretariat (2022). Observations are reported from the United States and Mexico. Reported occurrences in North Carolina, California, and Alabama do not represent established populations and therefore have been excluded from the climate matching analysis.

## 6 Distribution Within the United States

---



**Figure 2.** Reported distribution of *Hopia obtusa* in the United States. Map from GBIF-US (2023). Observations are reported from Alabama, North Carolina, Kansas, Missouri, Oklahoma, Texas, Colorado, New Mexico, Arizona, California, Utah. Reported occurrences in North Carolina, California, and Alabama do not represent established populations and were not used in the climate matching analysis.

Points may be missing in Illinois and Arkansas as *Hopia obtusa* is reported to be native within these States but no georeferenced observations were available.

## 7 Climate Matching

---

### Summary of Climate Matching Analysis

The area with the highest climate match for *Hoplia obtusa* was in the southern and western United States, centered on the species' native range but expanding beyond. The lowest climate matches occurred along the Pacific Coast. Other areas of low match occurred along the northern Atlantic Coast and in small patches in the Appalachian and Rocky Mountain ranges. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.911, indicating that Yes, there is establishment concern for this species outside its native range. The Climate 6 score is calculated as: (count of target points with scores  $\geq 6$ )/(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 *Hoplia obtusa* (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.



**Species:** *Hopia obtusa*

**Selected Climate Stations** ●

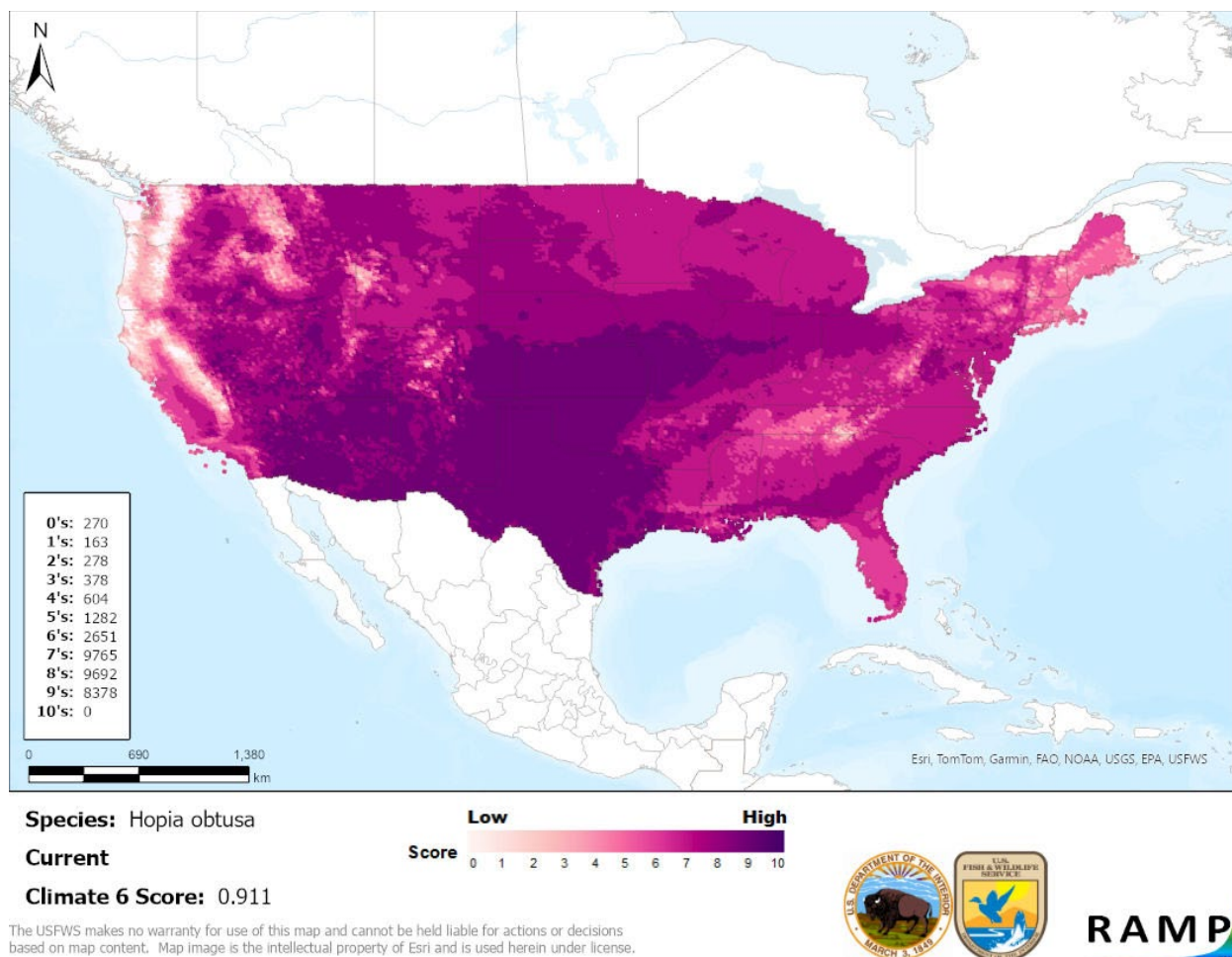


**RAMP**

The USFWS makes no warranty for use of this map and cannot be held liable for actions or decisions based on map content. Map image is the intellectual property of Esri and is used herein under license.

**Figure 3.** RAMP (Sanders et al. 2023) source map showing weather stations in the United States and Mexico selected as source locations (red; United States and Mexico) and non-source locations (gray) for *Hopia obtusa* 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 *Hopia obtusa* 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 *Hopia obtusa* is classified as Low. There is a reasonable amount of information regarding species in general and the distribution. However, there is no information on the history of invasiveness other than basic evidence of being in trade.

## 9 Risk Assessment

### Summary of Risk to the Contiguous United States

*Hopia obtusa*, Vine Mesquite, is a flowering plant that is native to Mexico and the United States (Illinois, Arkansas, Missouri, Kansas, Oklahoma, Texas, Colorado, New Mexico, Arizona, Utah). *H. obtusa* is a warm season, stoloniferous perennial that grows and produces from Spring to August. Vine Mesquite is grazed by livestock and wildlife. Humans use this grain as a method to control erosion in waterways and small gullies. Although introduced at one point in the Czech Republic, it is unclear if there was ever an established population. There were no other records of



introduction found. This species is available in trade and can be shipped throughout the United States. No information on the volume of trade was available. Therefore, the History of Invasiveness for *Hopia obtusa* is classified as No Known Nonnative Population. The climate matching analysis for the contiguous United States indicates establishment concern for this species outside its native range. The highest climate match was present in this species native range as well as the surrounding areas in the southwestern and mid-western states. The Certainty of Assessment for this ERSS is classified as Low due to the lack of information regarding introductions and impacts. The Overall Risk Assessment Category for *Hopia obtusa* in the contiguous United States is Uncertain.

## Assessment Elements

- **History of Invasiveness (see section 4): No Known Nonnative Population**
- **Establishment Concern (see section 7): Yes**
- **Certainty of Assessment (see section 8): Low**
- **Remarks, Important additional information: Recent valid name change from *Panicum obtusum*.**
- **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.**

Borderlands Restoration. 2023. Vine mesquite, *Hopia obtusa*, container plant. Available: <https://www.borderlandsplants.org/product-page/vine-mesquite-hopia-obtusa> (February 2023).

Curtis and Curtis Seed. 2019. Vine mesquite. Available: <https://curtisseed.com/vine-mesquite/> (February 2023).

GBIF Secretariat. 2022. GBIF backbone taxonomy: *Hopia obtusa* (Kunth) Zuloaga & Morrone. Copenhagen: Global Biodiversity Information Facility. Available: <https://www.gbif.org/species/4117271> (February 2023).

GBIF-US. 2023. Species occurrences: *Hopia obtusa* (Kunth) Zuloaga & Morrone. Available: <https://doi.org/10.15468/dl.axgunr> (February 2023).

[ITIS] Integrated Taxonomic Information System. 2023. *Hopia obtusa* (Kunth) Zuloaga & Morrone. Reston, Virginia: Integrated Taxonomic Information System. Available: [https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=783536#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=783536#null) (February 2023).

Magee P. 2005. Plant fact sheet: vine mesquite *Panicum obtusum* Kunth. Baton Rouge, Louisiana: USDA, NRCS National Plant Data Center.

- Pyšek P, Danihelka J, Sádlo J, Chrtěk J Jr., Chytrý M, Jarošík V, Kaplan Z, Krahulec Z, Moravcová L, Pergl J, Štajerová K, Tichý L. 2012. Catalogue of alien plants of the Czech Republic (2<sup>nd</sup> edition): checklist update, taxonomic diversity and invasion patterns. *Preslia* 84:155–255.
- Sanders S, Castiglione C, Hoff M. 2023. Risk Assessment Mapping Program: RAMP. Version 5.0. U.S. Fish and Wildlife Service.
- USDA, NRCS. 2023. *Panicum obtusum* Kunth. The PLANTS database. Greensboro, North Carolina: National Plant Data Team. Available: <https://plants.usda.gov/home/plantProfile?symbol=PAOB> (February 2023).
- [USFWS] U.S. Fish and Wildlife Service. 2024. Standard operating procedure: how to prepare an “Ecological Risk Screening Summary.” Version 3.
- [WFO] World Flora Online. 2023. World Flora Online – a project of the World Flora Online Consortium. Available: <http://www.worldfloraonline.org> (February 2023).
- Zuloaga FO, Giussani LM, Morrone O. 2007. *Hopia*, a new monotypic genus segregated from *Panicum* (Poaceae). *Taxon* 56:145–156.

## 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 in this section.

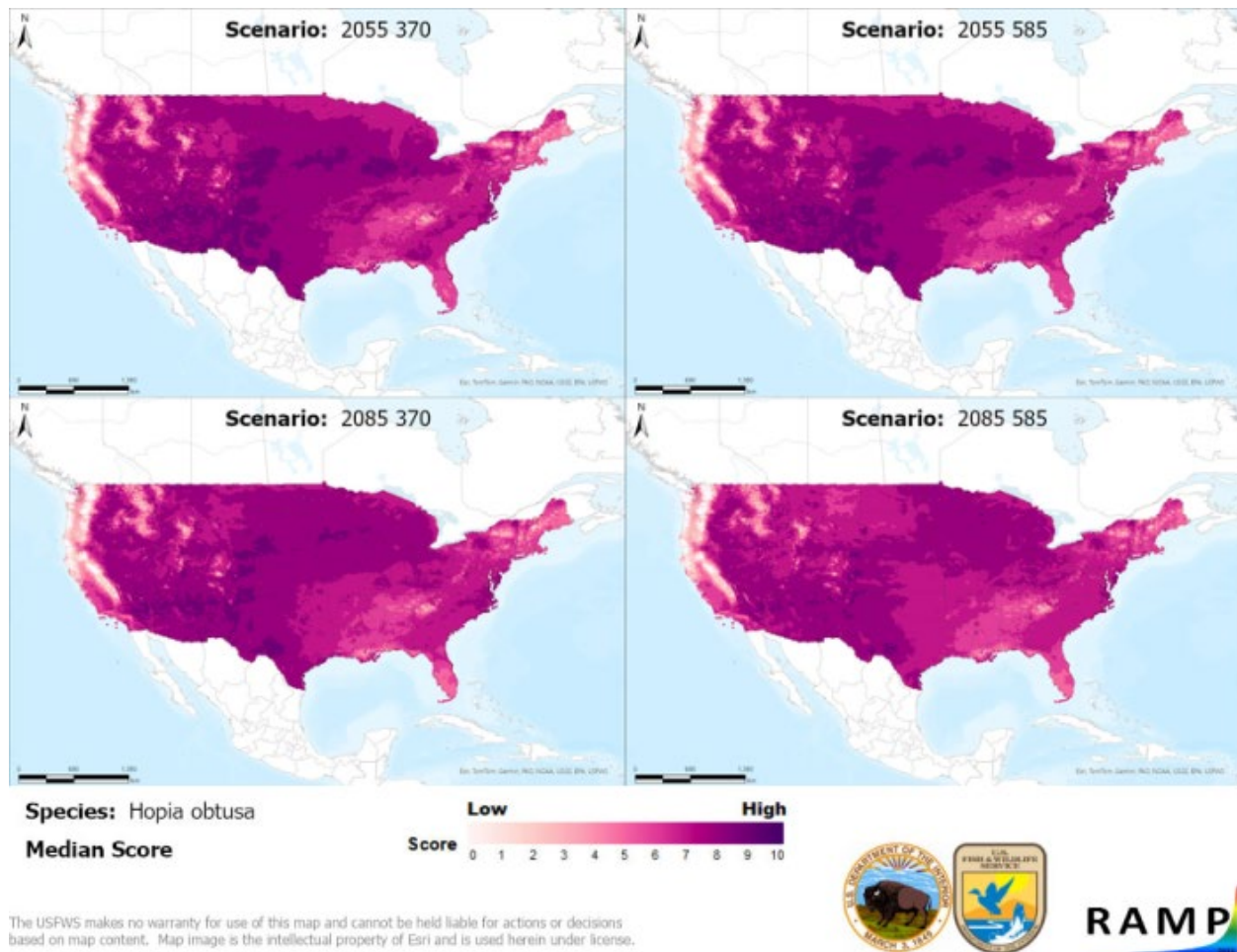
# Appendix

---

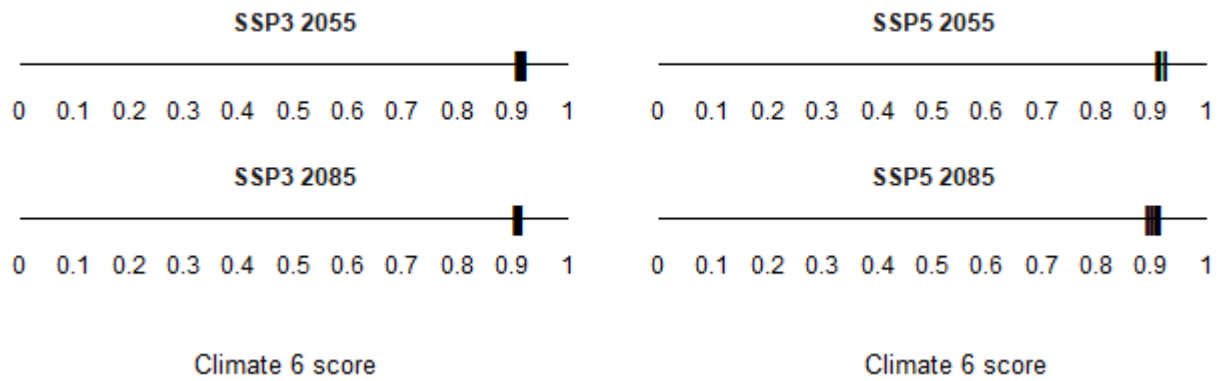
## Summary of Future Climate Matching Analysis

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).

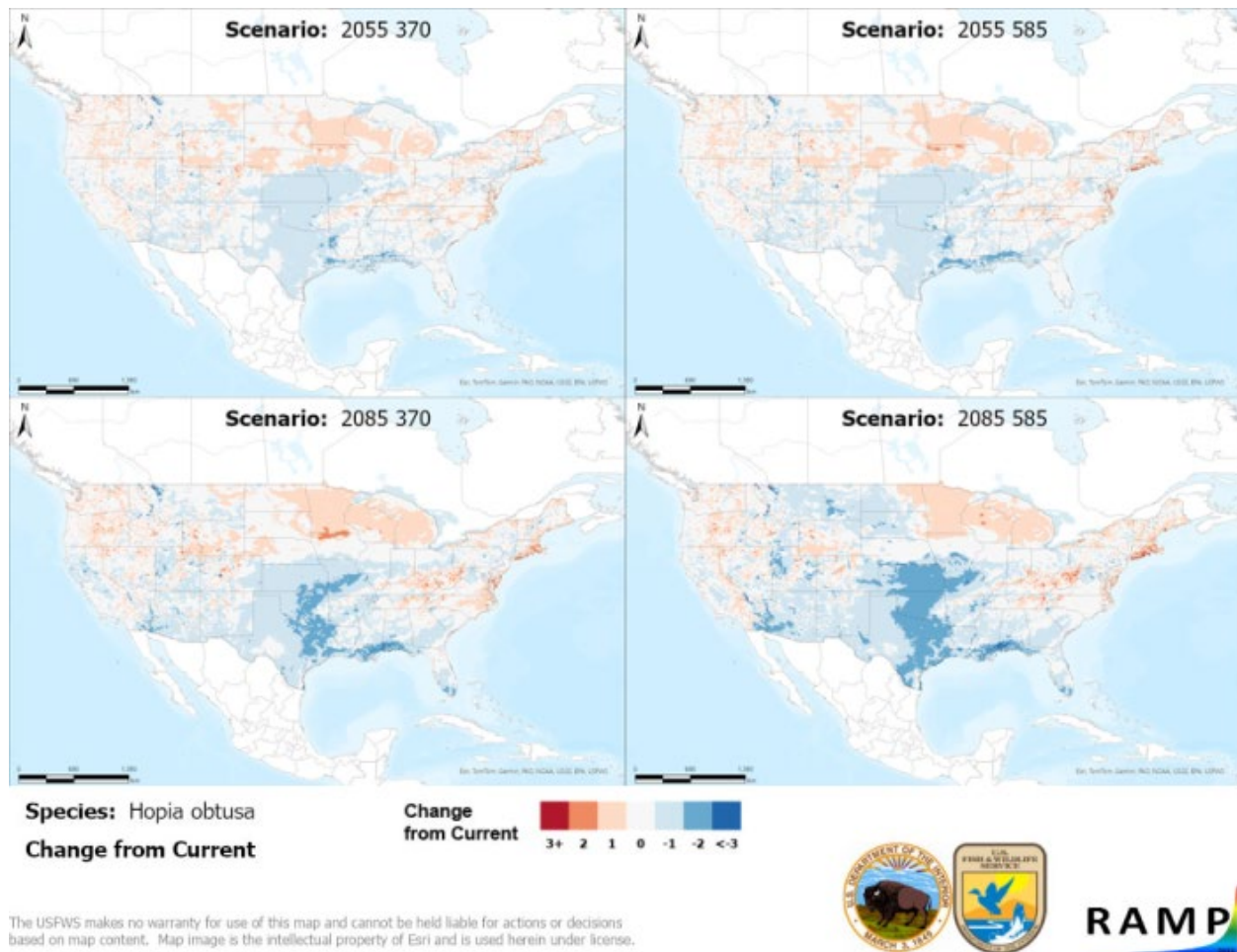
Under the future climate scenarios (figure A1), on average, high climate match for *Hopia obtusa* was projected to occur in the Colorado Plateau, Great Basin, Great Lakes, Mid-Atlantic, Northern Plains, Southern Plains, and Southwest regions of the contiguous United States. Areas of low climate match were projected to occur in the Northern Pacific Coast region and along the Sierra-Cascade Mountains. Areas of high match decreased in extent and areas of low match increased over time and from SSP3 to SSP5. The Climate 6 scores for the individual future scenario models (figure A2) ranged from a low of 0.892 (model: UKESM1-0-LL, SSP5, 2085) to a high of 0.924 (model: UKESM1-0-LL, SSP5, 2055). All future scenario Climate 6 scores were above the Establishment Concern threshold, indicating that Yes, there is an establishment concern for this species outside its native range. The Climate 6 score for the current climate match (0.911, 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 SSP3, 2055 (figure A3). Under one or more time step and climate scenarios, areas within the Appalachian Range, Northeast, and Northern Plains 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 Colorado Plateau, Great Basin, Gulf Coast, Southeast, Southern Florida, Southern Plains, Southwest, and Western Mountains saw a moderate decrease in the climate match relative to current conditions. No large decreases were observed regardless of time step and climate scenarios. The areal extent of decreased climate match was greater in the 2085 time period than in 2055.



**Figure A1.** Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Hopia obtusa* 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 *Hopia obtusa* 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 *Hopia obtusa* 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: *Hopia obtusa* (Kunth) Zuloaga & Morrone. Copenhagen: Global Biodiversity Information Facility. Available: <https://www.gbif.org/species/4117271> (February 2023).
- [IPCC] Intergovernmental Panel on Climate Change. 2021. Climate change 2021: the physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.



Karger DN, Conrad O, Böhner J, Kawohl T, Kreft H, Soria-Auza RW, Zimmermann NE, Linder P, Kessler M. 2017. Climatologies at high resolution for the Earth land surface areas. *Scientific Data* 4:170122.

Karger DN, Conrad O, Böhner J, Kawohl T, Kreft H, Soria-Auza RW, Zimmermann NE, Linder HP, Kessler M. 2018. Data from: Climatologies at high resolution for the earth's land surface areas. *EnviDat*. Available: <https://doi.org/10.16904/envidat.228.v2.1>.

Sanders S, Castiglione C, Hoff M. 2023. Risk Assessment Mapping Program: RAMP. Version 5.0. U.S. Fish and Wildlife Service.