

Ditch Fencing Crayfish (*Faxonella clypeata*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, March 2023

Revised, March 2023

Web Version, 1/14/2025

Organism Type: Crustacean

Overall Risk Assessment Category: Uncertain



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<https://www.inaturalist.org/photos/20638030> (March 2023).

1 Native Range and Status in the United States

Native Range

From Crandall (2010):

“The species occurs along the Gulf Coastal Plain in Oklahoma and eastern Texas, East to the Florida panhandle and North through Georgia to the upper coastal plain in South Carolina; and also in the lower Mississippi Valley West of the Mississippi River, from Louisiana to

southeastern Missouri (Hobbs 1989, Pflieger 1996). Pflieger (1996) believed that this species was probably more widely distributed in Missouri before the area was ditched and drained.”

Status in the United States

From Crandall (2010):

“NATIVE

Extant (resident)

United States (Alabama, South Carolina, Texas, Mississippi, Florida, Georgia)”

“Presence Uncertain

United States (Louisiana, Missouri, Oklahoma, Arkansas)”

According to Daniel (2023), nonindigenous occurrences of *Faxonella clypeata* have been reported in the Middle Chattahoochee-Lake Harding watershed in Georgia and the Upper Leaf watershed in Mississippi. The introduction in Georgia resulted in an established population (last reported in 1937) but the status of the Mississippi introduction is unknown (last reported in 2015).

Faulkes (2015) reports that *F. clypeata* occasionally appears in online aquarium auctions in North America.

Regulations

State regulations that may apply to *Faxonella clypeata* under the synonym *Cambarus clypeatus* were found. All species of the genus *Cambarus* are regulated in California (CDFW 2021) and Hawaii (HDOA 2019). All species in the family *Cambaridae* are regulated in Arizona (Arizona Game and Fish Commission 2022), Nevada (Nevada Board of Wildlife Commissioners 2022), Oregon (ODFW 2022), New Mexico (except for native species; NMDGF 2023), Utah (Utah DWR 2020), Washington (WDFW 2022), and Wisconsin (Wisconsin DNR 2022). Please refer back to state agency regulatory documents for details on the regulations, including restrictions on activities involving this species. While effort was made to find all applicable regulations, this list may not be comprehensive. Notably, it does not include regulations that do not explicitly name this species or its genus or family, for example, when omitted from a list of authorized species with blanket regulation for all unnamed species.

Means of Introductions within the United States

From Daniel (2023):

“Bait buckets”

From USGS (2025a):

“Stocked [in Peg Factory Lake near Hamilton, Georgia] for a private fish-cultural project.”

Remarks

From Crandall (2010):

“Furthermore, the range of this species has not been clearly defined. Research is needed to ascertain whether or not current records for Missouri, Arkansas, and Oklahoma are based on correct identification (Fetzner 2008).”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2023):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Protostomia
Superphylum Ecdysozoa
Phylum Arthropoda
Subphylum Crustacea
Class Malacostraca
Subclass Eumalacostraca
Superorder Eucarida
Order Decapoda
Suborder Pleocyemata
Infraorder Astacidea
Superfamily Astacoidea
Family Cambaridae
Subfamily Cambarinae
Genus *Faxonella*
Species *Faxonella clypeata* (Hay, 1899)

According to De Grave (2020), *Faxonella clypeata* (Hay, 1899) is the accepted name for this species.

The following synonyms from ITIS (2023) were used to search for information for this report: *Cambarus clypeatus*.

Size, Weight, and Age Range

From Mobberly and Pfrimmer (1967):

“[...] adults ca. 15 mm in cephalothorax length [...]”

Environment

From NatureServe (2023):

“It occurs in slow streams, marshes, swamps and ditches [...] (Schuster and Taylor, 2004)”

From Bouchard and Robison (1980):

“These small crayfishes typically inhabit lentic waters such as roadside ditches, ponds, and backwaters of streams and are dominant inhabitants of very small streams (less than two-thirds of a meter wide). Because these species are tertiary burrowers they are able successfully to occupy seasonal waters that begin to dry in late spring.”

Climate

Mirenda and Dimock (1985), citing Mobberly (1965), report a median heat tolerance of 36.5°C for *F. clypeata* after 12 hours of acclimation at 21°C. It is not known whether these temperatures refer to water or air.

Distribution Outside the United States

Native

The native range of *Faxonella clypeata* is wholly within the United States. See section 1 for details.

Introduced

No records were found of introduction of *Faxonella clypeata* in the wild outside the United States.

Means of Introduction Outside the United States

No records were found of introduction of *Faxonella clypeata* in the wild outside the United States.

Short Description

From Robison and McAllister (2014):

“*Faxonella clypeata* is a small crayfish (≤ 5 cm in total length) with a short, broad, turned down rostrum lacking marginal spines. The areola is short and wide and the cervical spine is absent with chelae sexually dimorphic. Male gonopods of Form I specimens possess only a central projection and a mesial process. The central projection of the gonopod is three times longer than the mesial projection. The mesial process is short, stout, and extending at most a quarter length of the central projection, never overlapping the other mesial process. Tips of the central projection overlap in normal position like crossed sabers when viewed from below. Copulatory hooks are found only on leg 3.”

Biology

From Daniel (2023):

“This species during dry periods will burrow into the mud instead of migrating (Smith 1953).”

From Mobberly and Pfrimmer (1967):

“Marking and recapture study of a population of ditch-dwelling crawfish *Faxonella clypeata* indicated that this species does not have a small confined home range, but moves freely about the bottom.”

From Crandall (2010):

“Recent surveys in Arkansas found this species to be locally abundant when encountered (K. Crandall pers. comm. 2009).”

“This species is a tertiary burrower inhabiting slow or sluggish streams, marshes, swamps and ditches (Mobberly and Pfrimmer 1967). In Missouri, it occurs in small intermittent creeks and shallows of seasonally flooded sloughs and swamps, when not in burrows (Pflieger 1996). This species prefers relatively undisturbed habitat (Pflieger 1996).”

From Robison and McAllister (2014):

“Because this species is a secondary burrower, individuals construct simple burrows 10-30 cm deep topped by small turrets of tiny round pellets when water levels recede. Like Pflieger (1996), we found *F. clypeata* sequestered in these burrows for most of the year. We rarely found *F. clypeata* in permanent lentic situations. Generally, we found that this crayfish inhabited waters that dried up during the summer when they then took refuge in burrows dug into the ditch bottom or sides.”

Human Uses

From Crandall (2010):

“This species has been used in scientific experiments, whereby whole individuals are taken from the wild to be used for non fatal experiments (Mobberly and Owens 1966).”

Faulkes (2015) reports that *F. clypeata* occasionally appears in online aquarium auctions in North America.

Diseases

***Faxonella clypeata* has been documented as susceptible to *Aphanomyces astaci*, an etiological agent of crayfish plague listed by the World Organisation of Animal Health (2023).**

Svoboda et al. (2017) reported that *F. clypeata* has low susceptibility to *Aphanomyces astaci*.

Threat to Humans

No information was found on threats to humans from *Faxonella clypeata*.

3 Impacts of Introductions

Although *Faxonella clypeata* has been reported as introduced beyond its native range, no information was found regarding any impacts from the introductions.

The importation, possession, or trade *Faxonella clypeata* may be regulated by the following states (see Section 1 for more details): California (CDFW, 2021), Hawaii (HDOA 2019), Arizona (Arizona Game and Fish Commission 2022), Nevada (Nevada Board of Wildlife Commissioners 2022), New Mexico (NMDGF 2023), Oregon (ODFW 2022), Utah (Utah DWR 2020), Washington (WDFW 2022), Wisconsin (Wisconsin DNR 2022).

4 History of Invasiveness

The History of Invasiveness for *Faxonella clypeata* is classified as Data Deficient. Although this species is reportedly introduced beyond its native range, the potential impacts of these introductions are unknown. *F. clypeata* is present in live trade but the information available indicates trade occurs at a low frequency.

5 Global Distribution

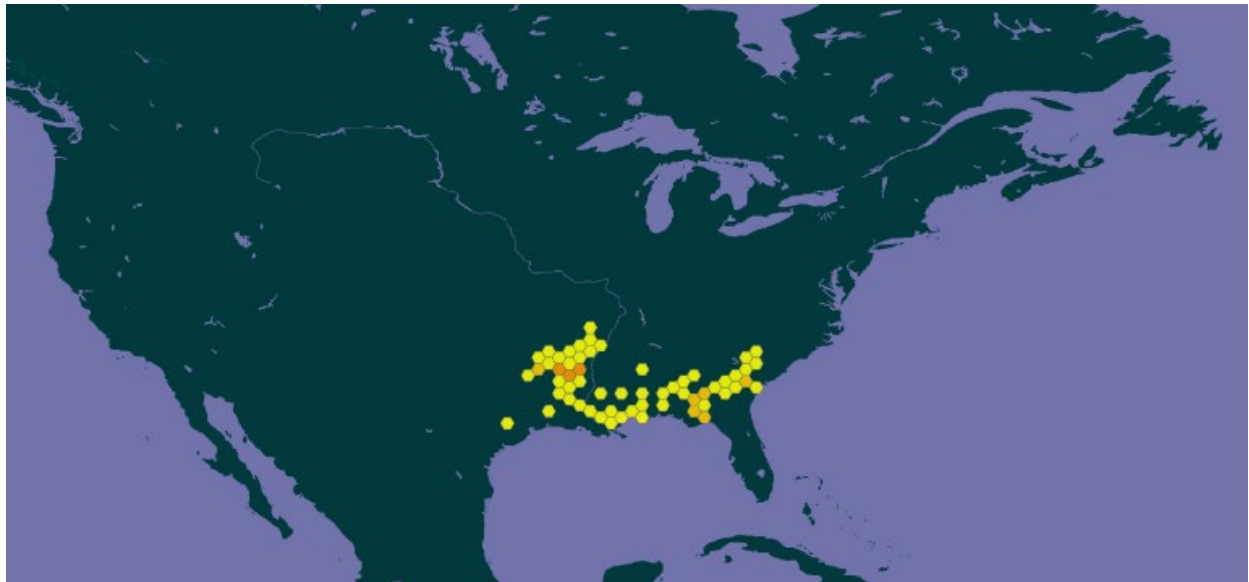


Figure 1. Reported global distribution of *Faxonella clypeata*. Map from GBIF Secretariat (2022). Observations are reported from the southern United States.

6 Distribution Within the United States

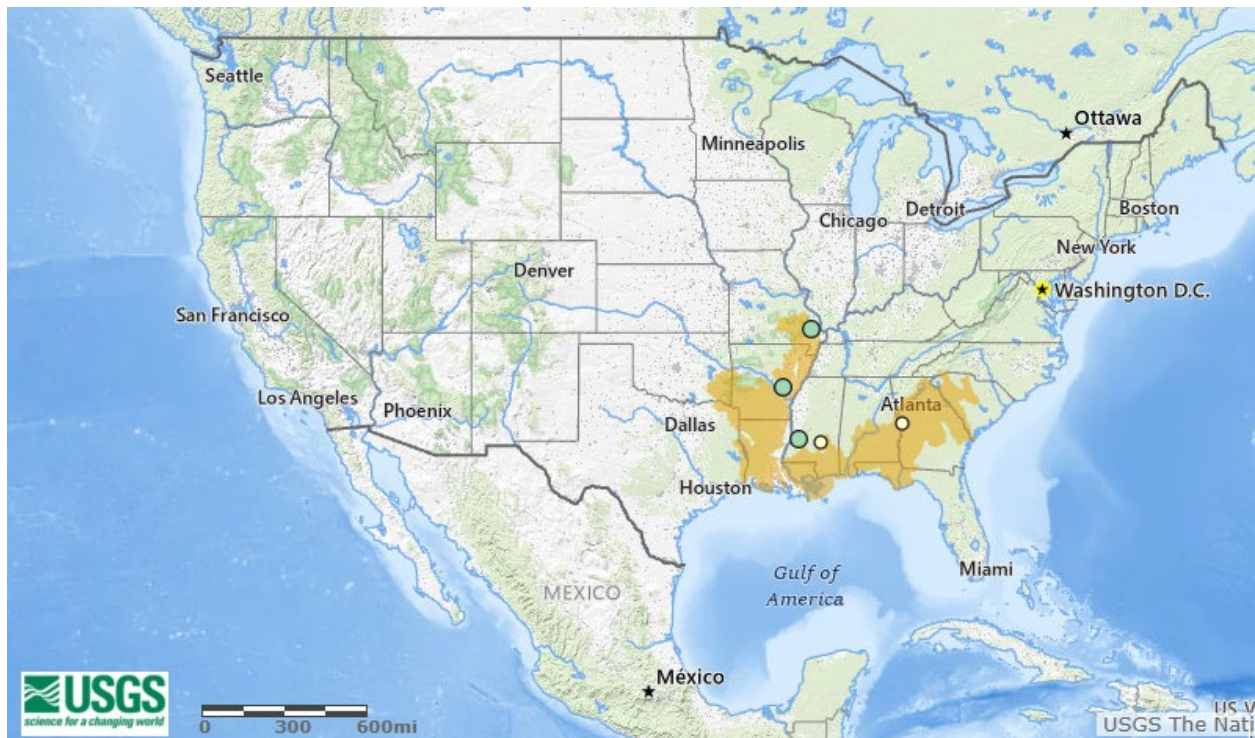


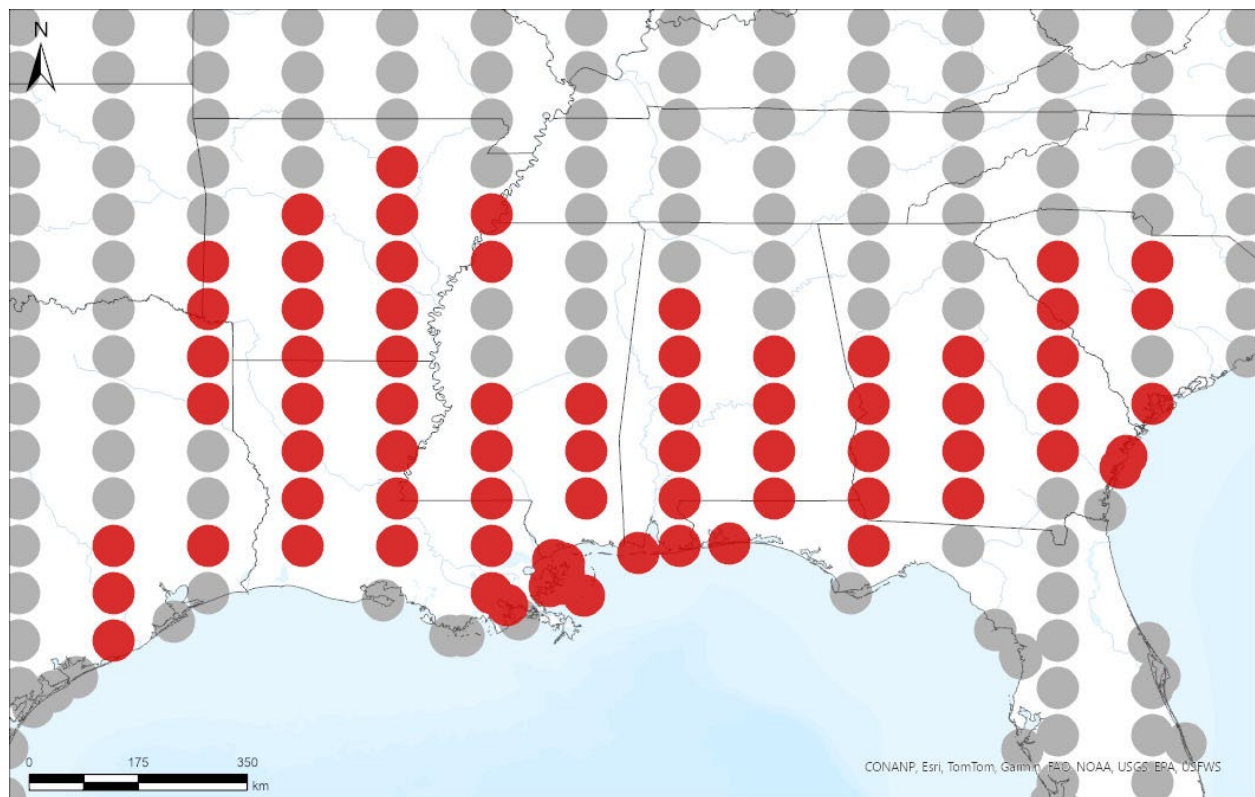
Figure 2. Reported distribution of *Faxonella clypeata* in the United States. Data from USGS NAS (2025b). Observations are reported from Alabama, Louisiana, Arkansas, Georgia, Florida, Mississippi, South Carolina, and Texas.

7 Climate Matching

Summary of Climate Matching Analysis

Areas in the contiguous United States that had a high climate match for *Faxonella clypeata* were in the South where this species is native, and in the southern portions of the Midwest and Ohio River Basin. Areas of low climate match were found in the northernmost portion of the Midwest, the Northern Plains, the Intermountain West, Southwest, and the West Coast. The Northeast and portions of the Midwest and Southern Plains had medium matches. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.290, 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 ≥ 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 *Faxonella clypeata* (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: *Faxonella clypeata*

Selected Climate Stations ●

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RAMP

Figure 3. RAMP (Sanders et al. 2023) source map showing weather stations in the southern United States selected as source locations (red; South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Oklahoma) and non-source locations (gray) for *Faxonella clypeata* 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.

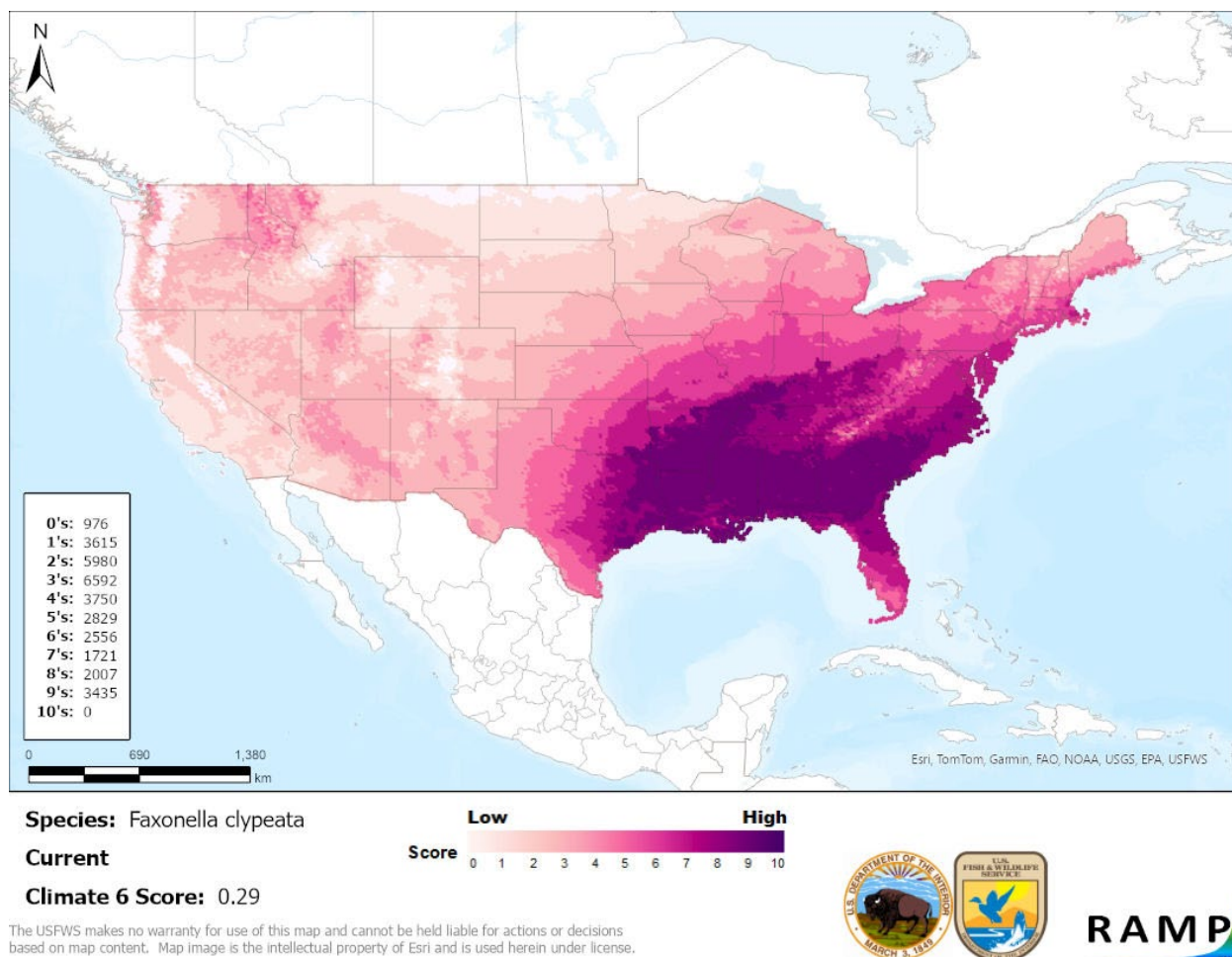


Figure 4. Map of RAMP (Sanders et al. 2023) climate matches for *Faxonella clypeata* in the contiguous United States based on source locations reported by GBIF Secretariat (2022). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

8 Certainty of Assessment

The Certainty of Assessment for *Faxonella clypeata* is classified as Low. There is information available on the biology and distribution of this species. Some portions of the species' range may not be well understood. Although this species is reportedly introduced beyond its native range, no information was found regarding impacts of introductions.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Faxonella clypeata, ditch fencing crayfish, is a crustacean that is native to the Gulf Coastal Plain and lower Mississippi River Valley in the contiguous United States. It digs and inhabits burrows that can sustain the species during periods of low water. The species rarely occurs in the aquarium trade in North America; it has also been used for scientific experimentation, bait, and fish cultural purposes. Occurrences outside the native range have been reported in northern

Georgia and northern Mississippi, but only the Georgia population is reported as established. The History of Invasiveness for *F. clypeata* is classified as Data Deficient due to the lack of information on any impacts of this introduction. The climate matching analysis for the contiguous United States indicates establishment concern for this species outside its native range. Areas of high match were found in the South and southern portions of the Midwest and Ohio River Basin. The Certainty of Assessment for this ERSS is classified as Low due to the lack of information available regarding the species' history of invasiveness and uncertainty in the native range. The Overall Risk Assessment Category for *Faxonella clypeata* 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: Susceptible to crayfish plague; WOA-Reportable.**
- **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 *Faxonella clypeata* was projected to occur in the Appalachian Range, Mid-Atlantic, Southeast, and Southern Atlantic Coast regions of the contiguous United States. There were also small areas of medium-high match in the northern Western Mountains in some scenarios. Areas of low climate match were projected to occur in California, the Colorado Plateau, Great Basin, Northern Pacific Coast, Northern Plains, Southwest, and Western Mountains regions. The Climate 6 scores for the individual future scenario models (figure A2) ranged from a low of 0.339 (model: GFDL-ESM4, SSP3, 2055) to a high of 0.400 (model: IPSL-CM6A-LR, SSP3, 2085). All future scenario Climate 6 scores were above the Establishment Concern threshold, indicating that Yes, there is establishment concern for this species under future scenarios. The Climate 6 score for the current climate match (0.290, figure 4) falls below the range of scores for future projections. The time step and climate scenario with the most change relative to current conditions was SSP5, 2085, the most extreme climate change scenario. Under one or more time step and climate scenarios, areas within the Appalachian Range, Great Lakes, Northeast, and Northern Plains saw a large increase in the climate match relative to current conditions. Additionally, areas within the Colorado Plateau, Mid-Atlantic, Southeast, Southern Plains, and Western Mountains saw a moderate increase in the climate match relative to current conditions. Under one or more time step and climate scenarios, areas within the Gulf Coast, Southeast, Southern Atlantic Coast, and Southern Florida regions saw a moderate decrease in the climate match relative to current conditions. No large decreases were observed regardless of time step and climate scenarios. Additional, very small areas of large or moderate change may be visible on the maps (figure A3). The degree of change was larger further in the future and for SSP5 as compared to SSP3.

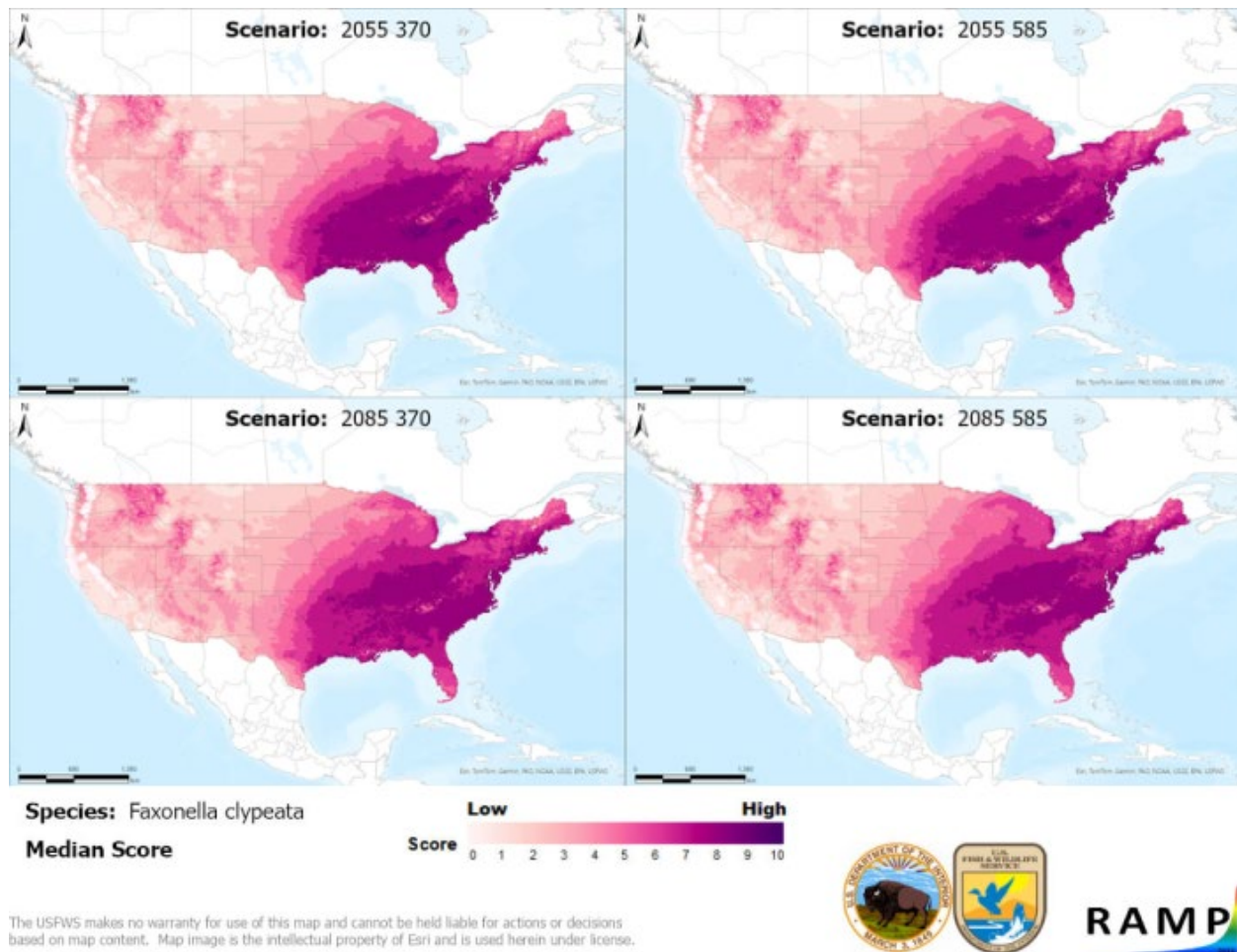


Figure A1. Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Faxonella clypeata* in the contiguous United States. Climate matching is based on source locations reported by GBIF Secretariat (2022). Shared 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.

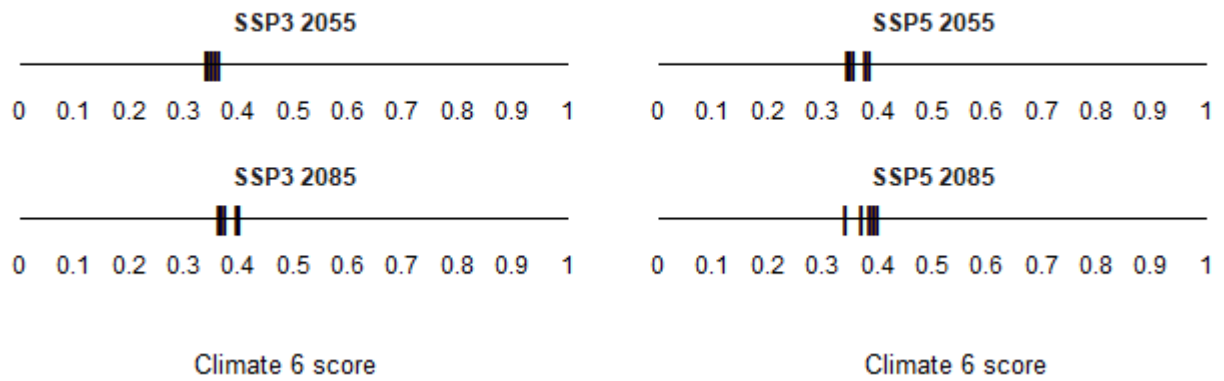


Figure A2. Comparison of projected future Climate 6 scores for *Faxonella clypeata* in the contiguous United States for each of five global climate models under four combinations of Shared Socioeconomic Pathway (SSP) and time step. SSPs used (from left to right): SSP3, SSP5 (Karger et al. 2017, 2018; 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.

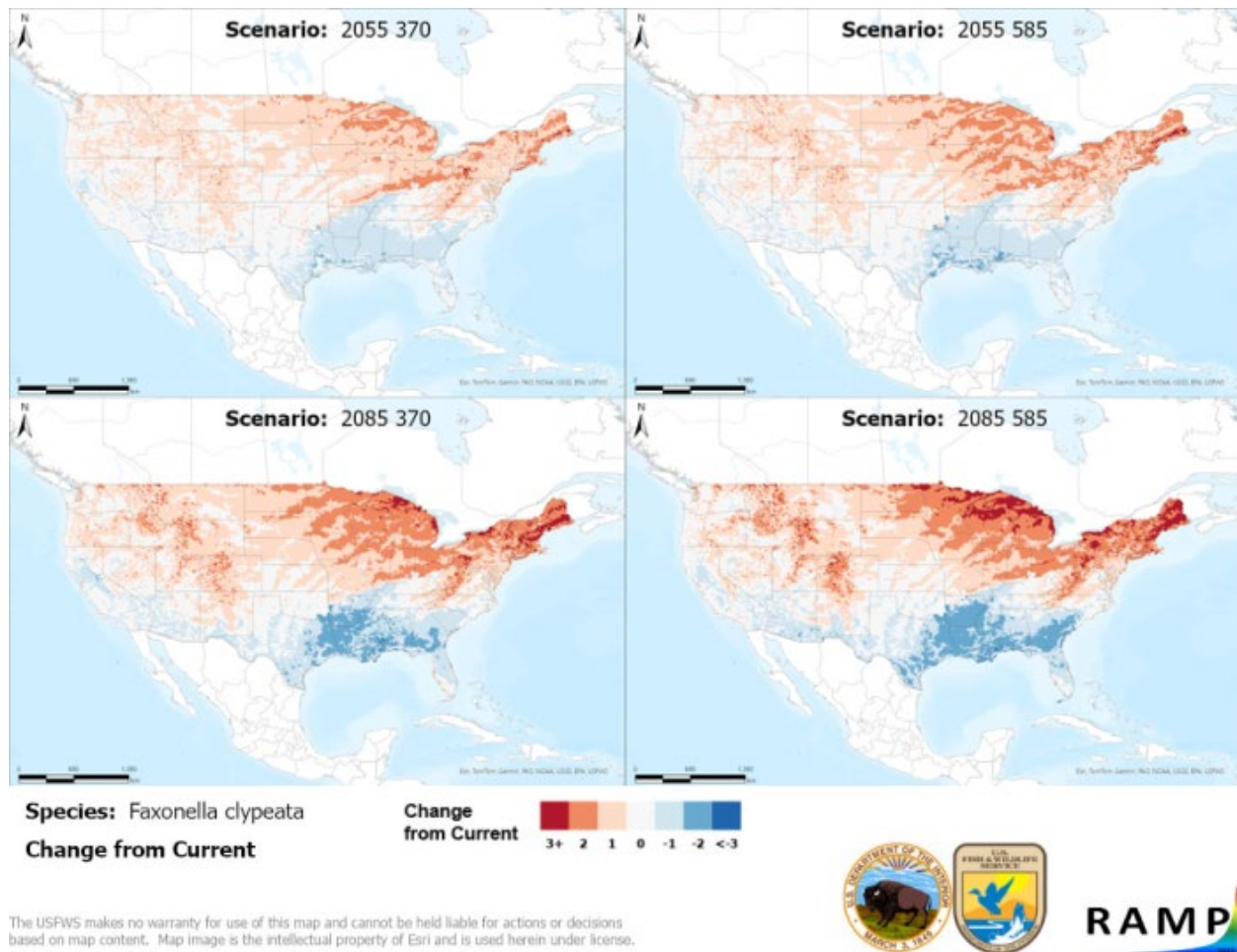


Figure A3. RAMP (Sanders et al. 2023) maps of the contiguous United States showing the difference between the current climate match target point score (figure 4) and the median target point score for future climate scenarios (figure A1) for *Faxonella clypeata* based on source locations reported by GBIF 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.

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