Humpbacked Peaclam (*Euglesa supina*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, January 2023
Revised, February 2023
Web Version, 3/5/2025

Organism Type: Mollusk
Overall Risk Assessment Category: Uncertain

Photo: Welter Schultes, Francisco. Public Domain. Available: http://www.animalbase.uni-goettingen.de/zooweb/servlet/AnimalBase/home/picture?id=2390 (January 2023).

1 Native Range and Status in the United States

Native Range

From Kipp et al (2019a):

"*Pisidium supinum* [synonym of *Euglesa supina*] is native to Eurasia, including Iceland (Clarke 1981)."

From Prié (2011):

"This species is known from France, Poland, Germany, Hungary, Switzerland and the UK (Clarke 1981), as well as Central Asia (Kipp 2011)."

"It can occur in high densities, and 1,088 individuals per m^2 were found during November 2007 in the River Danube [Europe]. This species was generally found to be abundant in this river (Bódis 2007)."

From Kuiper and Wolff (1970):

"In the Netherlands it is rather rare and probably absent over large areas."

"Ellis (1962), however, records this species from canals in England, and during our investigations we found it in the Brielse Meer (Lake Brielle) [Netherlands]."

Status in the United States

According to Kipp et al. (2019a), nonindigenous occurrences of *Euglesa supina* have been reported in New York (Lake Ontario, 1959) and Minnesota (Lake Superior, 2005). The authors report that *E. supina* is established in both locations.

From Prié (2011):

"This species has also been reported from the eastern end of Lake Ontario in 1959, most likely introduced from Eurasia."

From Kipp et al. (2019b):

"*Pisidium supinum* was recorded for the first time in the Great Lakes basin in Lake Ontario in 1959. It is also present in Lake Erie. It may have been present in the Great Lakes much earlier than 1959 (Clarke 1981, Corkum 2000, Grigorovich et al. 2003, Johnson and Mathesons 1968, MacIsaac 1999)."

From Trebitz et al. (2010):

"[…] we conducted intensive sampling in the Duluth-Superior Harbor and lower St. Louis River in 2005 and 2006. Of the similar to 240 benthic invertebrate taxa identified, 19 were non-indigenous, including 8 first detection records for this system: […] *Pisidium supinum* […]"

No records of *Euglesa supina* in trade in the United States were found.

Regulations

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

Means of Introductions within the United States

From Kipp et al. (2019a):

"*Pisidium supinum* was probably introduced by the shipping industry, likely via solid ballast, which was in use at the turn of the [20th] century (Grigorovich et al. 2000)."

Remarks

From Kipp et al. (2019a):

"It is also debated whether or not it [*Euglesa supina*] is indigenous to North America. Fossil deposits have been found in Alberta and Idaho, but it is most common at present in the Great Lakes and St. Lawrence. Most recent authors believe it is introduced from Eurasia (Clarke 1981, Herrington 1962, MacIsaac 1999, Mackie 2000, Quinn et al. 1996, Reckendorfer et al. 2006)."

From Kuiper et al. (1989):

“It is said to have been collected from Upper-Pliocene and Lower Pleistocene deposits in Idaho, U.S.A (Clarke 1981:416).”

“The occurrence of *P. supinum* in Iceland (Clarke 1981:416) needs confirmation.”

The following synonym of *Euglesa supina* from MolluscaBase (2023) was used to search for information for this report: *Pisidium supinum*.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From MolluscaBase (2023):

Biota > Animalia (Kingdom) > Mollusca (Phylum) > Bivalvia (Class) > Autobranchia (Subclass) > Heteroconchia (Infraclass) > Euheterodonta (Subterclass) > Imparidentia (Superorder) > Sphaeriida (Order) > Sphaerioidea (Superfamily) > *Sphaeriidae* (Family) > *Sphaeriinae* (Subfamily) > *Euglesa* (Genus) > *Euglesa supina* (Species)

According to MolluscaBase (2023), *Euglesa supina* is the current valid name for this species.

From Prié (2011):

“This species has been placed in the family Sphaeriidae, although some authors regard the *Pisidium* as worthy of listing as a distinct family, Pisiidae; traditionally, it is still placed as a subfamily of the Sphaeriidae.”

Size, Weight, and Age Range

From Kipp et al. (2019a):

“This triangular, somewhat inflated bivalve has a height to length ratio of approximately 0.9.”

“**Size:** can grow to around 4.5 mm in length (Clarke 1981, Mackie 2000).”

Environment

From Kipp et al. (2019a):

“*Pisidium supinum* is generally rheophilic, preferring lotic waters in canals and rivers, although it can tolerate more lentic waters in lakes. It is usually found in coarse sand, silty sand, or mud. […] It is very sensitive to eutrophication but is resilient to both low waters and floods in the River Issel, Netherlands, where it can reach densities of 24,000 individuals per m^2 (Bishop and Hewitt 1976, Extence et al. 1999, Hinz et al. 1982, Mackie 2000, Mouthon 1996, Piechocki and Strzelec 1999, Reckendorfer et al. 2006, Smit et al. 1994, 1995, Zettler 1996).”

From Prié (2011):

“This species is known to inhabit lotic (rivers) environments, and has a reduced longitudinal extent which corresponds to strict ecological requirements (Mouthon 1999). The numbers of individuals was [sic] found to rise with increasing cadmium levels (Reckendorfer et al. 2006), and the species is found only in large rivers (Sommerhäuser et al. 2003). This species was found to be most abundant in the top 5 cm layer of sediment, and this is likely to be due to higher oxygen levels (Bódis 2007).”

“Systems: Freshwater”

From Kuiper and Wolff (1970):

“It is a typical lowland species, not found at altitudes of over 300 m (Kuiper, 1966).”

“According to Van Benthem Jutting (1954) the species was found at a maximum salinity of 0.2%c Cl'. From this and our observations it may be deduced that the maximum salinity tolerated by this species is not over 0.3%e-Cl'.”

“*P. supinum* almost always occurs in running water. In the Biesbosch area [Netherlands] it was frequently encountered on the bottom of creeks with maximum current velocities of 0.8 m/sec. during normal tides and still higher values during storm tides.”

“*P. supinum* only occurs in small numbers in the intertidal area, not exceeding 13 specimens/sq.m. It was found intertidally up to 70 cm above mean low water level, on sandy as well as on more muddy sediments. The total tidal range in this area amounts to about 200 cm. The maximum depth at which we found this species was about 6 m; deeper places have been rarely sampled.”

Climate

Kuiper et al. (1989):

“General distribution: palearctic, central latitudes, […]”

Distribution Outside the United States

Native

From Kipp et al (2019a):

“*Pisidium supinum* is native to Eurasia, including Iceland (Clarke 1981).”

From Prié (2011):

“This species is known from France, Poland, Germany, Hungary, Switzerland and the UK (Clarke 1981), as well as Central Asia (Kipp 2011).”

"It can occur in high densities, and 1,088 individuals per m^2 were found during November 2007 in the River Danube [Europe]. This species was generally found to be abundant in this river (Bódis 2007)."

From Kuiper and Wolff (1970):

"In the Netherlands it is rather rare and probably absent over large areas."

"Ellis (1962), however, records this species from canals in England, and during our investigations we found it in the Brielse Meer (Lake Brielle)."

Introduced

From Mackie (2007):

"Harris (1973) gives an anomalous record of this species [*Pisidium henslowanum*] in western Canada, but it is probably *Pisidium supinum*."

Mackie (2007) lists *Euglesa supina* (under the name *Pisidium supinum*) as present in Ontario, Canada.

From Kipp et al. (2019a):

"In North America *P. supinum* is much more common in the Ottawa River [Ontario and Quebec, Canada] […] than the Great Lakes."

Means of Introduction Outside the United States

No information regarding means of introduction outside of the United States was found for *Euglesa supina*.

Short Description

From Kipp et al. (2019a):

"The shell displays distinct beaks with an oblique ridge, thick hinge teeth, and cardinal teeth that are relatively far from the anterior denticles. The dorsal side of the shell is very short and rounded, the anterior side is straight and long but starts to round ventrally, and the posterior side is relatively blunt. There are around 16–18 striae per mm on the shell surface (Clarke 1981, Mackie 2000)."

Biology

From Kipp et al. (2019a):

"*Pisidium supinum* filter feeds on planktonic algae and specifically prefers diatoms. It filters suspended material from the water column mostly via movements of its foot and cilia but can directly ingest deposits from the sediments as well (Lopez and Holopainen 1987, Mackie 2000)."

"*Pisidium* spp. are hermaphrodites and ovoviviparous with relatively low reproductive output. They produce a few young per brood and around one or two broods per year (Boycott 1936)."

Human Uses

No information was found on human uses of *Euglesa supina*.

Diseases

No information was found associating *Euglesa supina* with any diseases listed by the World Organisation for Animal Health (2023).

No information was found on diseases associated with *Euglesa supina*.

Threat to Humans

No information was found on threats to humans from *Euglesa supina*.

3 Impacts of Introductions

From Kipp et al. (2019a):

"The impacts of this species are currently unknown, as no studies have been done to determine how it has affected ecosystems in the invaded range. The absence of data does not equate to lack of effects. It does, however, mean that research is required to evaluate effects before conclusions can be made."

No species-specific state regulations were found for this species.

4 History of Invasiveness

The History of Invasiveness for *Euglesa supina* is classified as Data Deficient. There are records of introduction for *E. supina* in North America; it has become established where introduced. However, no information was found regarding impacts of introductions.

5 Global Distribution

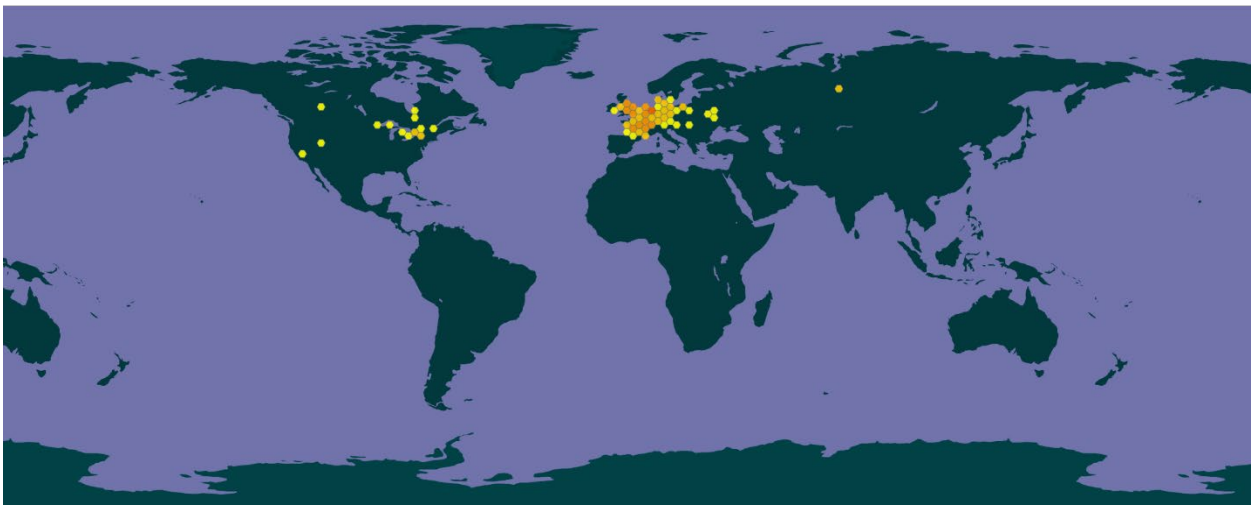

Figure 1. Reported global distribution of *Euglesa supina*. Map from GBIF Secretariat (2022). Observations are reported from Canada, the United States, Europe, and Russia. Source locations from western Canada, western United States, northern Canada (Hudson Bay region), Ireland, Russia, and Ukraine were not used for climate matching as these locations are not known to represent currently established populations.

6 Distribution Within the United States

Figure 2. Reported distribution of *Euglesa supina* in the United States. Map from GBIF-US (2023). Observations are reported from each of the Great Lakes, Utah, and California. The points in Utah and California do not represent known established populations and were not used in the climate matching analysis.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Euglesa supina* to the contiguous United States was generally high around the Great Lakes, Northeast, and upper Midwest. Small areas of high match were scattered in the Rocky Mountain region. Areas of low match were found in Florida, Gulf Coast, and in areas in California, Oregon, and Washington along the Pacific Coast, as well as the Sierra Nevada and Cascade Mountains. Elsewhere generally had a medium match. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.751, 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 *Euglesa supina* (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.

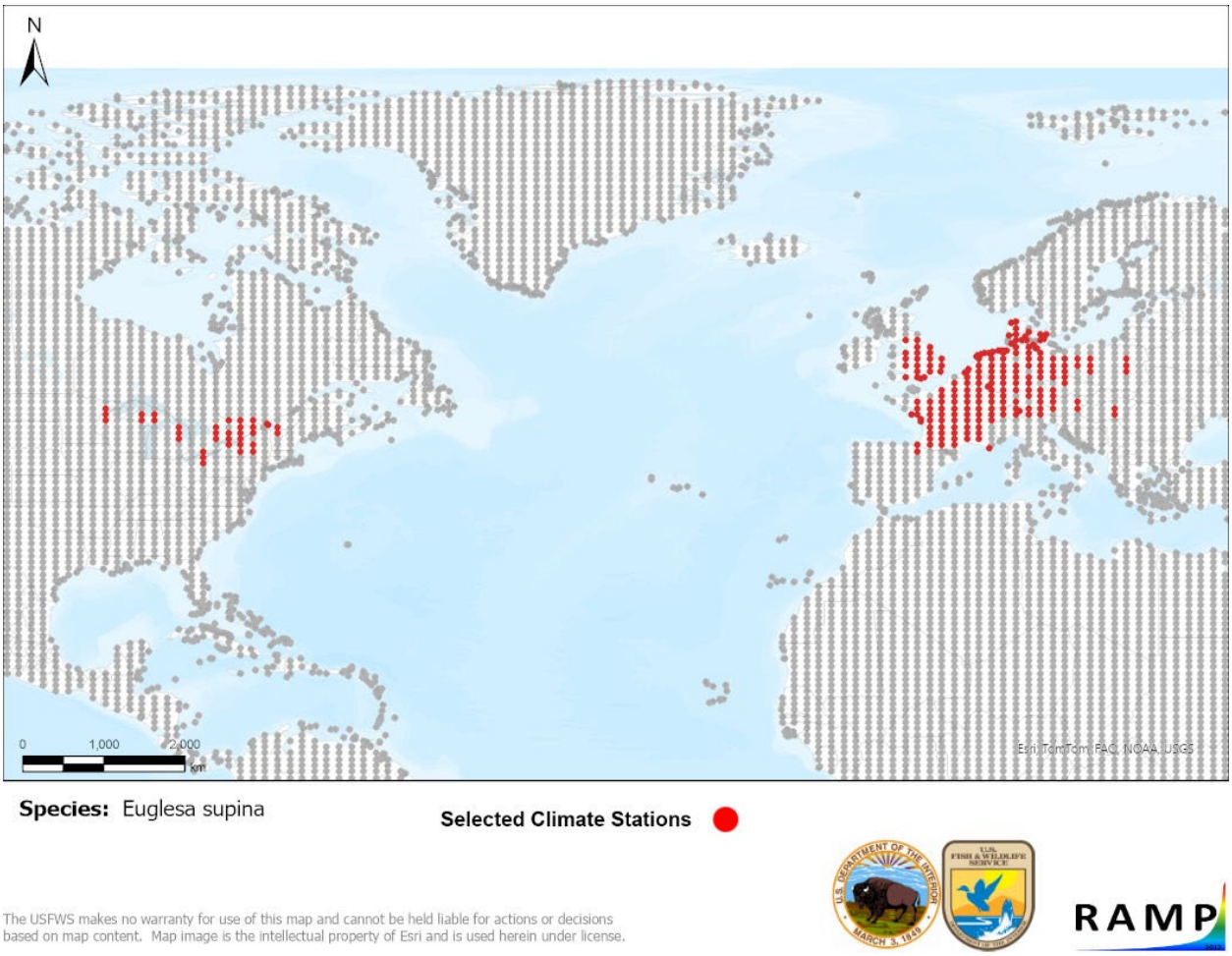

Figure 3. RAMP (Sanders et al. 2023) source map showing weather stations in North America and Europe selected as source locations (red; United States, Canada, Netherlands, France, United Kingdom, Germany, Switzerland, Belgium, Poland, Denmark, Luxembourg, Austria) and non-source locations (gray) for *Euglesa supina* 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. Source locations from western and northern Canada (Hudson Bay region), western United States, Ireland, Russia, Ukraine were not used for climate matching as these locations do not represent currently established populations.

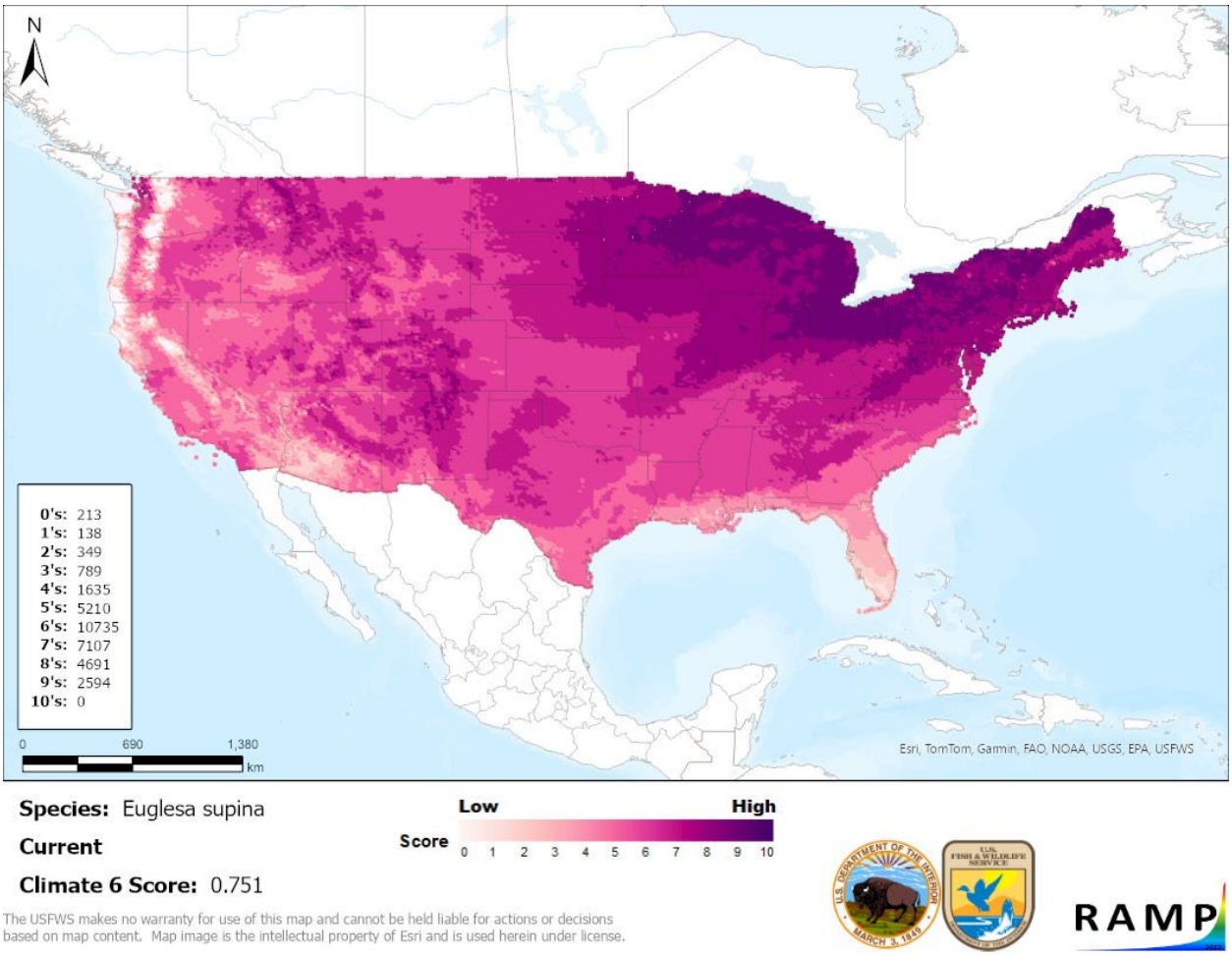

Figure 4. Map of RAMP (Sanders et al. 2023) climate matches for *Euglesa supina* in the contiguous United States based on source locations reported by GBIF Secretariat (2022). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

8 Certainty of Assessment

The Certainty of Assessment for *Euglesa supina* is classified as Low. Information was available on the biology, ecology, and distribution of *E. supina,* but no information was available on impacts of introduction and no information was found on the presence of *E. supina* in trade.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Euglesa supina, the Humpbacked Peaclam, is a mollusk that is native to Eurasia. This mollusk can tolerate multiple systems but prefers rivers. It typically filter-feeds diatoms. *E. supina* was likely introduced to North America through ballast water used in the shipping industry. It has established nonnative populations around the Great Lakes in Canada and the United States. The History of Invasiveness for *Euglesa supina* is classified as Data Deficient due to lack of information on impacts of introduction. The climate matching analysis for the contiguous United

States indicates establishment concern for this species. Areas of high match occurred in the Great Lakes, Northeast, upper Midwest, and in scattered locations around the Rocky Mountain region. Areas of low to medium match were found in Florida, Gulf Coast, and in parts of California, Oregon, and Washington. The Certainty of Assessment for this ERSS is classified as Low mainly due to the lack of information regarding impacts of introduction. The Overall Risk Assessment Category for *E. supina* 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 *Euglesa supina* was projected to occur in the Great Lakes region of the contiguous United States. Small areas of high match were also found in the northern Northeast, and in patches in the Western Mountains and Colorado Plateau. Areas of low climate match were projected to occur in the Northern Pacific Coast, along the Sierra-Cascade ranges, and Southern Florida regions. The Climate 6 scores for the individual future scenario models (figure A2) ranged from a low of 0.123 (model: UKESM1-0-LL, SSP5, 2085) to a high of 0.627 (model: MPI-ESM1-2-HR, SSP5, 2055). 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 (0.751, figure 4) falls above 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 all time step and climate scenarios only minor or no increases in the climate match relative to the current match were observed. Under one or more time step and climate scenarios, areas within the Appalachian Range, Great Lakes, Gulf Coast, Mid-Atlantic, Northeast, Northern Plains, Southeast, Southern Atlantic Coast, Southern Plains, and Southwest saw a large decrease in the climate match relative to current conditions. Additionally, areas within the California, Colorado Plateau, Great Basin, and Western Mountains saw a moderate decrease in the climate match relative to current conditions. The extent of areas of decrease greatly expanded with time. Additional, very small areas of large or moderate change may be visible on the maps (figure A3).

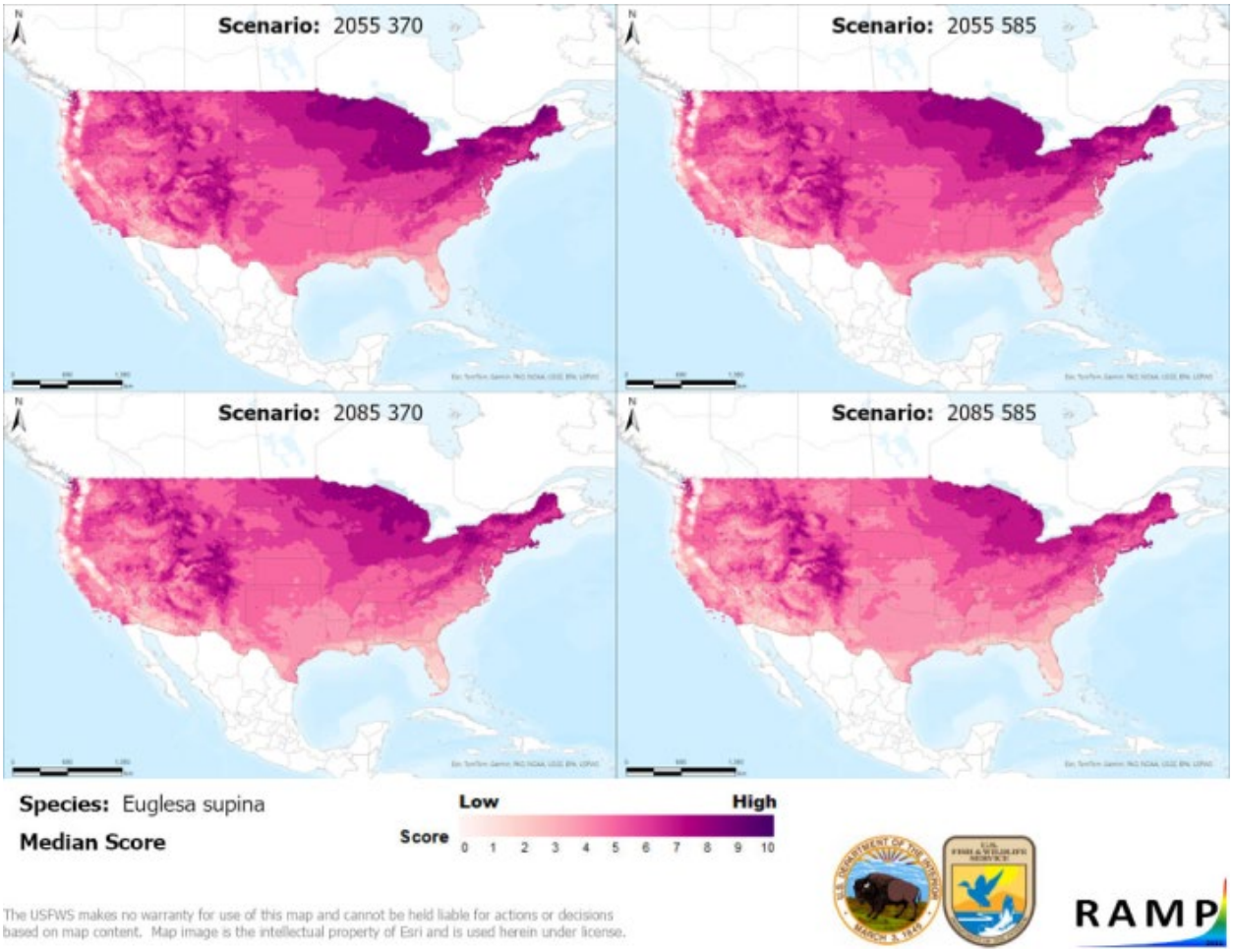

Figure A1. Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Euglesa supina* in the contiguous United States. Climate matching is based on source locations reported by GBIF Secretariat (2022). Shared Socioeconomic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

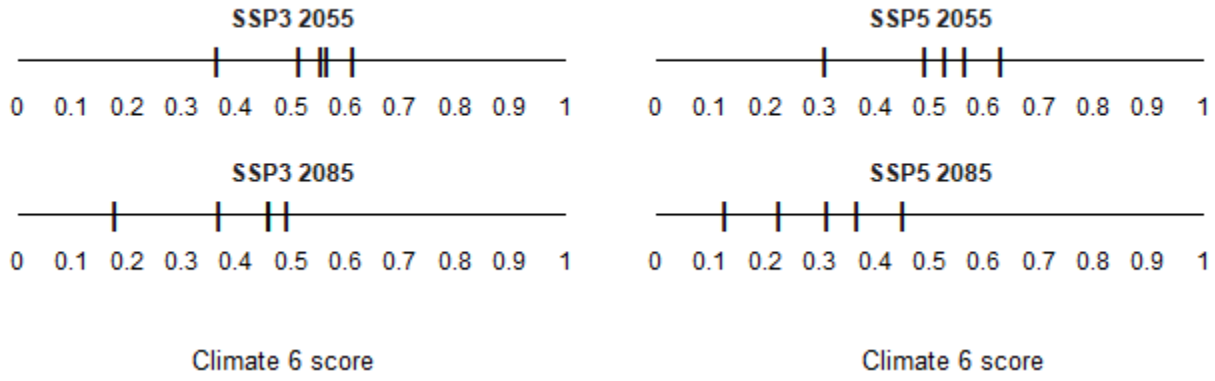

Figure A2. Comparison of projected future Climate 6 scores for *Euglesa supina* in the contiguous United States for each of five global climate models under four combinations of Shared Socioeconomic Pathway (SSP) and time step. SSPs used (from left to right): SSP3, SSP5 (Karger et al. 2017, 2018; IPCC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

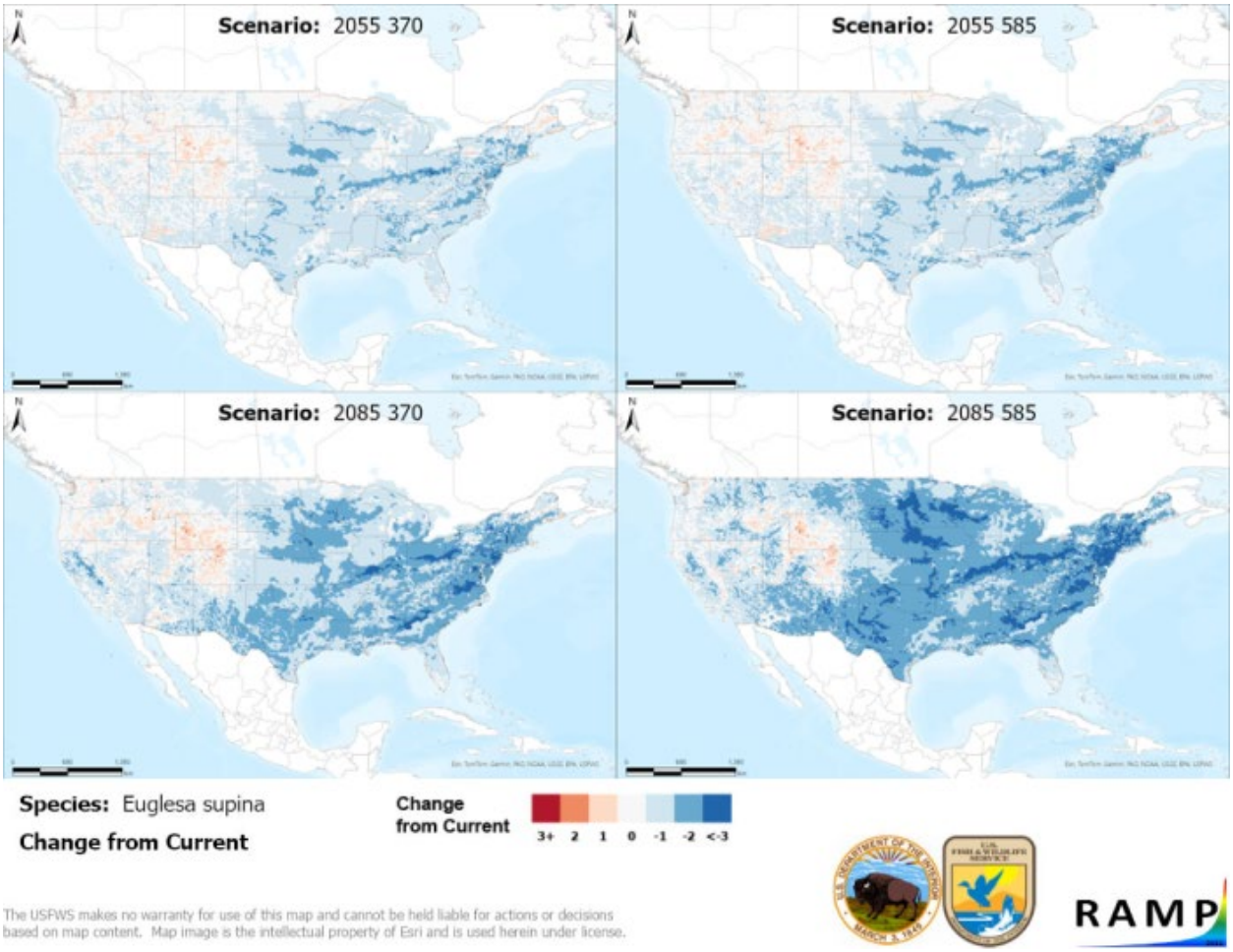

Figure A3. RAMP (Sanders et al. 2023) maps of the contiguous United States showing the difference between the current climate match target point score (figure 4) and the median target point score for future climate scenarios (figure A1) for *Euglesa supina* based on source locations reported by GBIF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