U.S. Fish & Wildlife Service

Lahontan Redside (*Richardsonius egregius*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2024
Revised, February 2025
Web Version, 9/25/2025

Organism Type: Fish
Overall Risk Assessment Category: Uncertain

Photo: Californiafishlover. Licensed under Creative Commons BY-NC 4.0. Available: https://www.gbif.org/occurrence/4892241538 (February 2025).

1 Native Range and Status in the United States

Native Range

From Nico and Fuller (2025):

"Native Range: Lahontan and other interior basins in northern and western Nevada, and northern California, including Humboldt, Walker, Carson, Truckee, Susan, Quinn, and Reese River systems; Walker, Tahoe, and Pyramid lakes (Page and Burr 1991)."

Status in the United States

From Nico and Fuller (2025):

"Native Range: Lahontan and other interior basins in northern and western Nevada, and northern California, including Humboldt, Walker, Carson, Truckee, Susan, Quinn, and Reese River systems; Walker, Tahoe, and Pyramid lakes (Page and Burr 1991)."

"Established in California (Moyle [1976]); reported, possibly established, in Nevada (Deacon and Williams 1984). The Ruby Lake [Nevada] population apparently did not survive (Hubbs et al. 1974)."

Regulations

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

Means of Introductions within the United States

From Nico and Fuller (2025):

"The species was stocked in Nye County, Nevada, in 1956 and 1957, and into Weber Lake, California (La Rivers 1962); the specific reasons for these introductions were not given. This species and *Rhinichthys osculus robustus* were introduced to Ruby Lake, Nevada, from a headwater of the Humboldt River, presumably to serve as forage for introduced largemouth bass (Hubbs et al. 1974). Most other records may have been the result of bait bucket releases (Kimsey 1950; Moyle [1976]) although Kimsey (1950) also argued that its occurrence in Miller Lake, California, a site near the Lahontan system, was possibly the result of a natural stream capture event."

Remarks

From NatureServe (2024):

"Hybridizes with *Gila bicolor* and *Rhinichthys osculus* (Lee et al. 1980)."

According to Fricke et al (2024), *Richardsonius microdon* is a hybrid of *Gila bicolor obesa* and *Richardson egregious*.

From Nico and Fuller (2025):

"Although Wydoski and Whitney (1979) reported the Lahontan Redside as introduced into the Bonneville basin, Idaho, we found no substantiating evidence to support this. Simpson and Wallace (1978), Lee et al. (1980 et seq.), Sigler and Sigler (1987), and Page and Burr (1991) make no mention of such an introduction. Because of several other errors in the same table, we chose not to include this record."

"It should be noted that its congener, *Richardsonius balteatus*, is called the redside shiner."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2024):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Cypriniformes
Superfamily Cyprinoidea
Family Leuciscidae
Subfamily Pogonichthyinae
Genus *Richardsonius*
Species *Richardsonius egregius* (Girard, 1858)

According to Fricke et al. (2024), *Richardsonius egregius* (Girard 1858) is the current valid name for this species.

The following synonyms of *Richardsonius egregius* from Fricke et al. (2024) were used to search for information for this report: *Gila ardesiaca*, *Tigoma egregia*, *Squalius galtiae*, *Phoxinus (Tigoma) clevelandi*.

Size, Weight, and Age Range

From Froese and Pauly (2024):

"Max length: 17.0 cm TL [total length] male/unsexed; [Page and Burr 1991]; common length: 7.2 cm TL male/unsexed; [Hugg 1996]; max. reported age: 5 years [Hugg 1996]."

Environment

From NatureServe (2024):

"Deep, quiet waters as well as swift currents of mountain tributaries; congregates around submerged logs, wharves, and other sheltered places (Lee et al. 1980). All types of stream habitats; most common in pools and slow runs; margins of lakes (Page and Burr 1991). Lake Tahoe: littoral zone, close to surface, except when water temperature is less than 10 C."

From Froese and Pauly (2024):

"Freshwater; benthopelagic"

Climate
From Froese and Pauly (2024):

“Temperate; 42°N - 37°N”

Distribution Outside the United States
Native
The native range of *Richardsonius egregius* is wholly within the United States, see section 1.

Introduced
No records were found for introduction of *Richardsonius egregius* in the wild outside the United States.

Means of Introduction Outside the United States
No records were found of introduction of *Richardsonius egregius* in the wild outside the United States.

Short Description
From Froese and Pauly (2024):

“Distinguished from a similar species *Richardsonius balteatus* by having less anal rays (8-9, rarely 10), longer snout, more slender body and less slender caudal peduncle (Page and Burr 2011).”

Biology
From NatureServe (2024):

“Generally matures in second or third year. In Nevada, spawns in May and June. Lake Tahoe: spawns in June and July. (Lee et al. 1980).”

“Lake Tahoe populations spawn either at the downstream end of pools in sand and gravel areas of tributaries, or over gravel and small rock substrate along the lake shoreline (Moyle 1976).”

“Congregates in large schools in lakes.”

“Migrates between breeding and nonbreeding habitats.”

“Feeds opportunistically on adult and larval insects, and planktonic crustaceans; also preys on sucker eggs. Eats at any time, day or night, but usually consumes flying insects at night, bottom and planktonic forms during day […]”

Human Uses

According to Nevada Board of Wildlife Commissioners (2022), *Richardsonius egregius* is authorized for use as bait in the western region of Nevada.

Diseases

No information was found associating *Richardsonius egregius* with any diseases listed by the World Organisation for Animal Health (February 2024).

According to Poelen et al. (2014), *Richardsonius egregius* has the following parasites: *Dactylogyrus egregius, Dactylogyrus richardsonius, Gyrodactylus richardsonius, Gyrodactylus egregius,* and *Pelucidphator pellucidhaptor.*

Threat to Humans

From Froese and Pauly (2024):

"Harmless"

3 Impacts of Introductions

From Nico and Fuller (2025):

"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."

4 History of Invasiveness

The History of Invasiveness for *Richardsonius egregius* is classified as Data Deficient. There are records of nonnative introductions that have led to established populations in California, but there is no information on any impacts of introduction.

5 Global Distribution

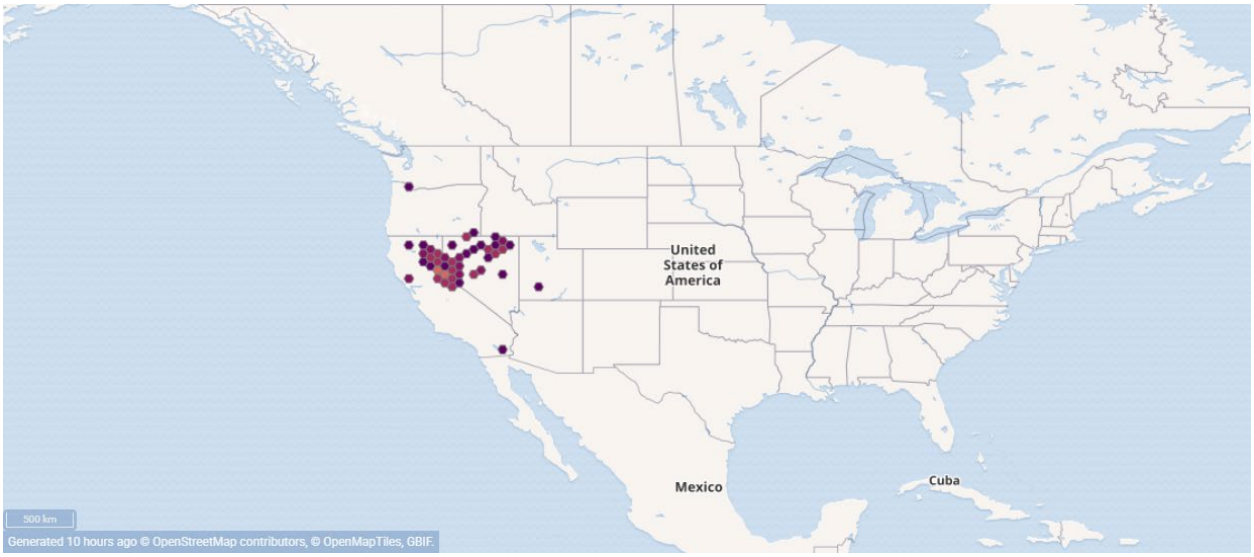

Figure 1. Reported global distribution of *Richarsonius egregius*. Map from GBIF Secretariat (2023). Observations are reported from the United States. Some observations in California (southern and northwestern California, and near San Francisco) and the observations in eastern central Nevada, Oregon, and Utah were not used to select source points for the climate matching analysis because there was no evidence of established populations in those locations.

6 Distribution Within the United States

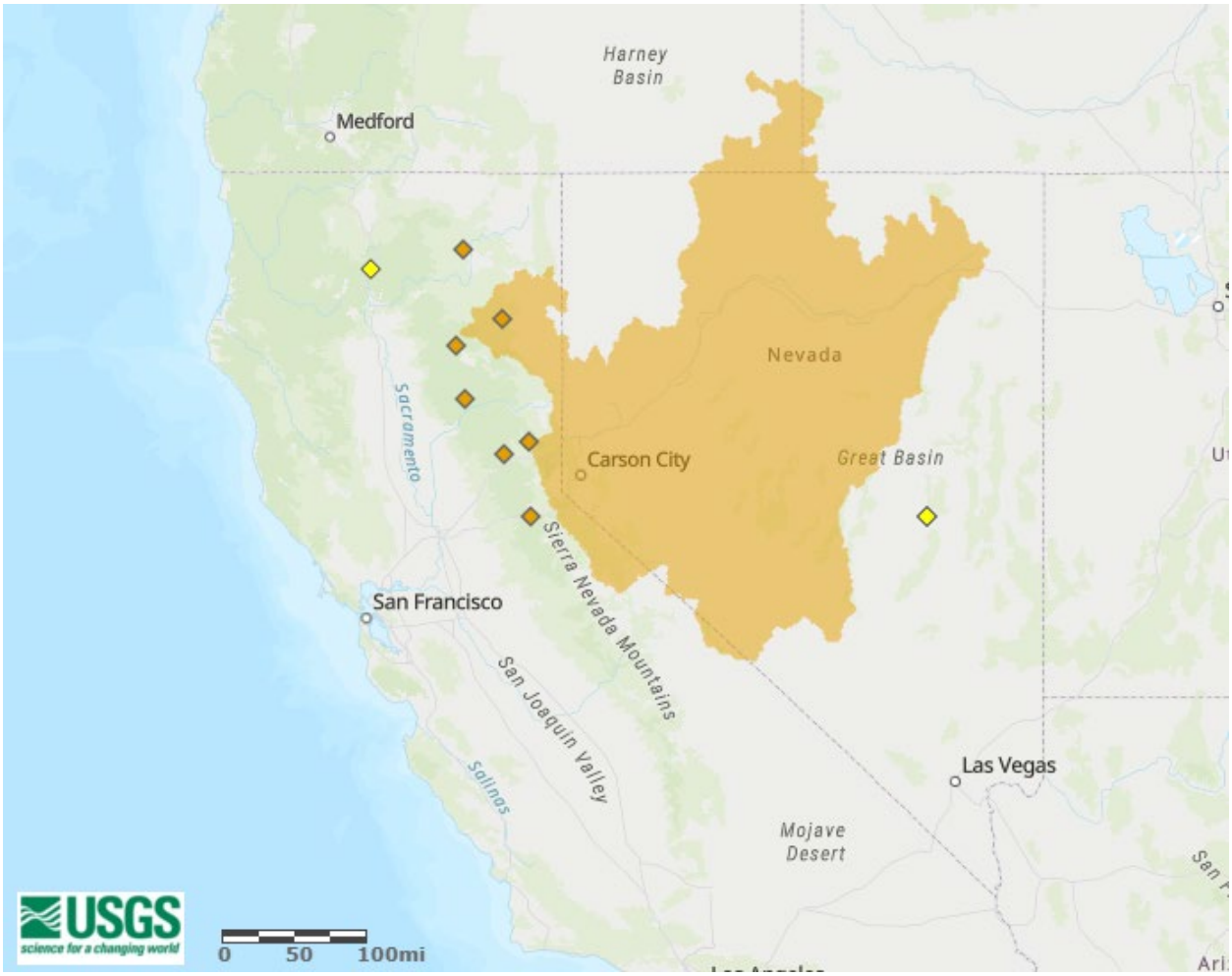

Figure 2. Reported distribution of *Richardsonius egregius* in the United States. Map from USGS (2025). Observations are reported from California and Nevada. Orange shading represents the native range of *R. egregius.* Records of nonnative occurrences representing established populations are indicated with orange diamonds; yellow diamonds indicate records of nonnative occurrences that do not represent an established population. Only records of established nonnative populations, along with records within the native range, were used to select source points for the climate matching analysis.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Richardsonius egregius* to the contiguous United States was high in the Great Basin, Colorado Plateau, Western Mountains, and areas of the Pacific Coast States. Areas of medium match were found in the Southwest, Great Plains, and upper Great Lakes. Areas of low match were found along the east coast as well as the southeastern portion of the United States. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.277, indicating that Yes, there is establishment

concern outside the 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 *Richardsonius egregius* (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.

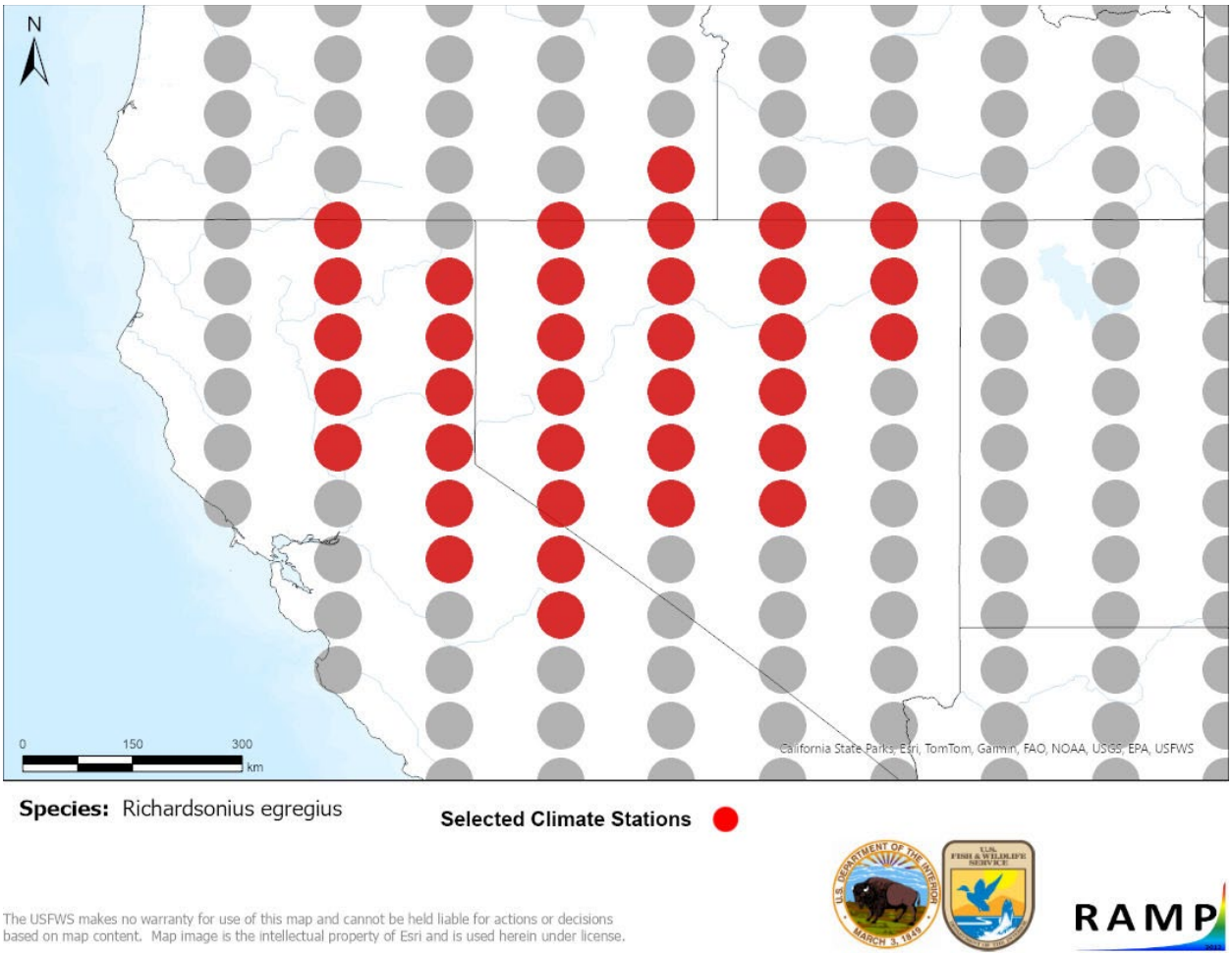

Figure 3. RAMP (Sanders et al. 2023) source map showing weather stations in the United States selected as source locations (red; California, Oregon, and Nevada) and non-source locations (gray) for *Richardsonius egregius* climate matching. Source locations from GBIF Secretariat (2024). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

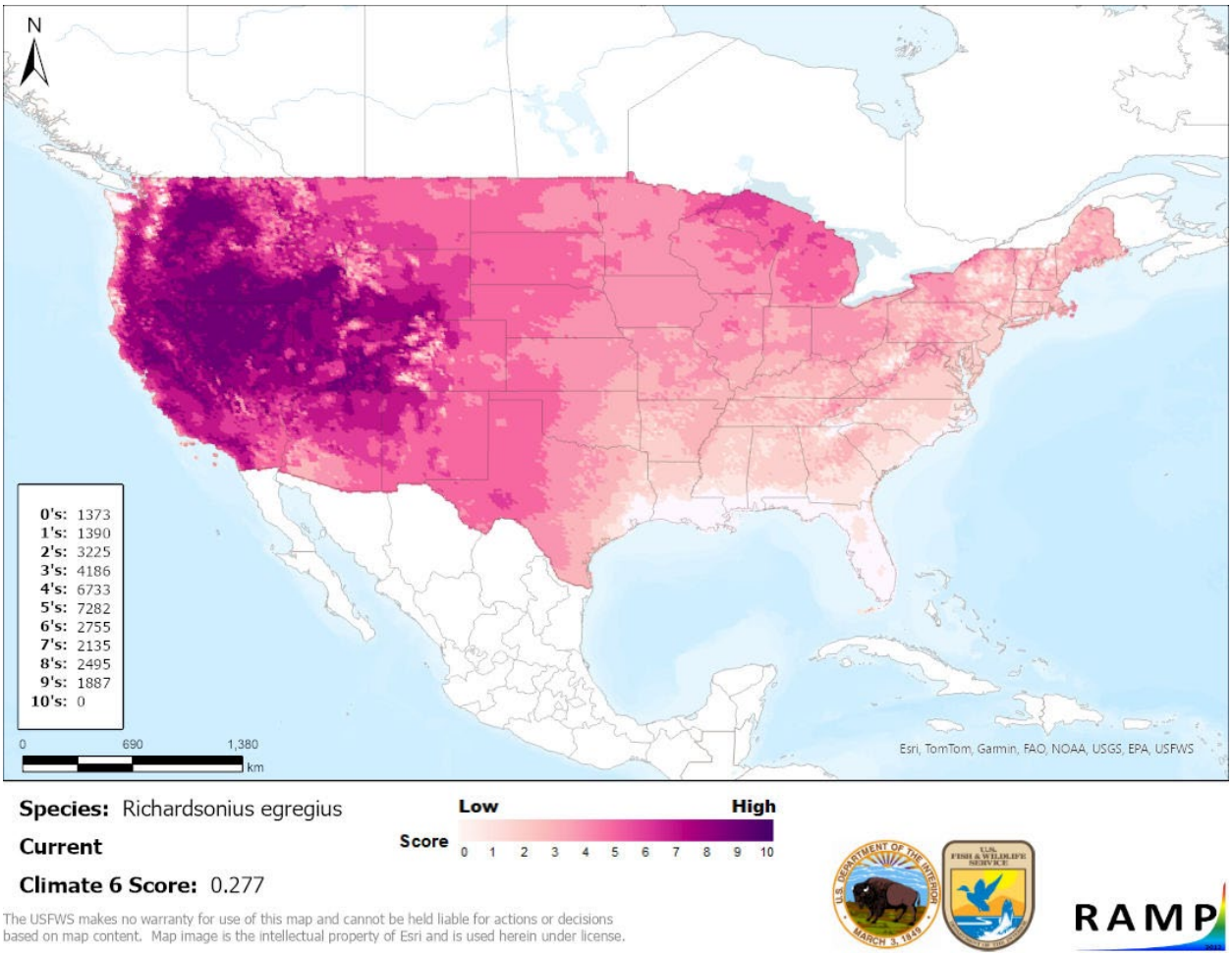

Figure 4. Map of RAMP (Sanders et al. 2023) climate matches for *Richardsonius egregius* in the contiguous United States based on source locations reported by GBIF Secretariat (2023). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

8 Certainty of Assessment

The Certainty of Assessment for *Richardsonius egregius* is classified as Low. There is information available on the biology of the species and the range is well described. However, there was no information found regarding any impacts of the documented introductions.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Richardsonius egregius, Lahontan Redside, is a fish that is native to portions of California and Nevada. *R. egregius* often inhabit deep, quiet waters as well as swift currents of mountain tributaries. *R. egregius* migrate between breeding and nonbreeding habitats and normally mature in 2-3 years. They can congregate in large schools in lakes and feed opportunistically on insects and planktonic crustaceans. The History of Invasiveness for *R. egregius* is classified as Data Deficient due to the lack of information on impacts of introduction. There are nonnative

populations that have become established in California, but there was no documentation of research into any impacts from those introductions. The climate matching analysis for the contiguous United States indicates establishment concern for this species outside its native range. High match was found across many western areas, including the native range, while low match was found in the eastern portions of the contiguous United States. The Certainty of Assessment for this ERSS is classified as Low due to the lack of information on any impacts of introduction. The Overall Risk Assessment Category for *Richardsonius egregius* 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 (2023).

Under the future climate scenarios (figure A1), on average, high climate match for *Richardsonius egregius* was projected to occur in the Great Basin region of the contiguous United States. Areas of medium match were found in other regions of the West and in the Northern Plains. Areas of low climate match were projected to occur in the Appalachian Range, Gulf Coast, Mid-Atlantic, Northeast, Southeast, Southern Atlantic Coast, 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 0.288 (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 (0.277, 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, 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 California, the Colorado Plateau, and the Great Basin saw a large decrease in the climate match relative to current conditions. Additionally, areas within the Appalachian Range, Great Lakes, Gulf Coast, Mid-Atlantic, Northeast, Northern Pacific Coast, Southeast, Southern Atlantic Coast, Southern Plains, Southwest, and the Western Mountains saw a moderate decrease in the climate match relative to current conditions. The magnitude of change from current conditions was more pronounced in time step 2085 than in time step 2055 under both scenarios, SSP3 and SSP5. Additional, very small areas of large or moderate change may be visible on the maps (figure A3).

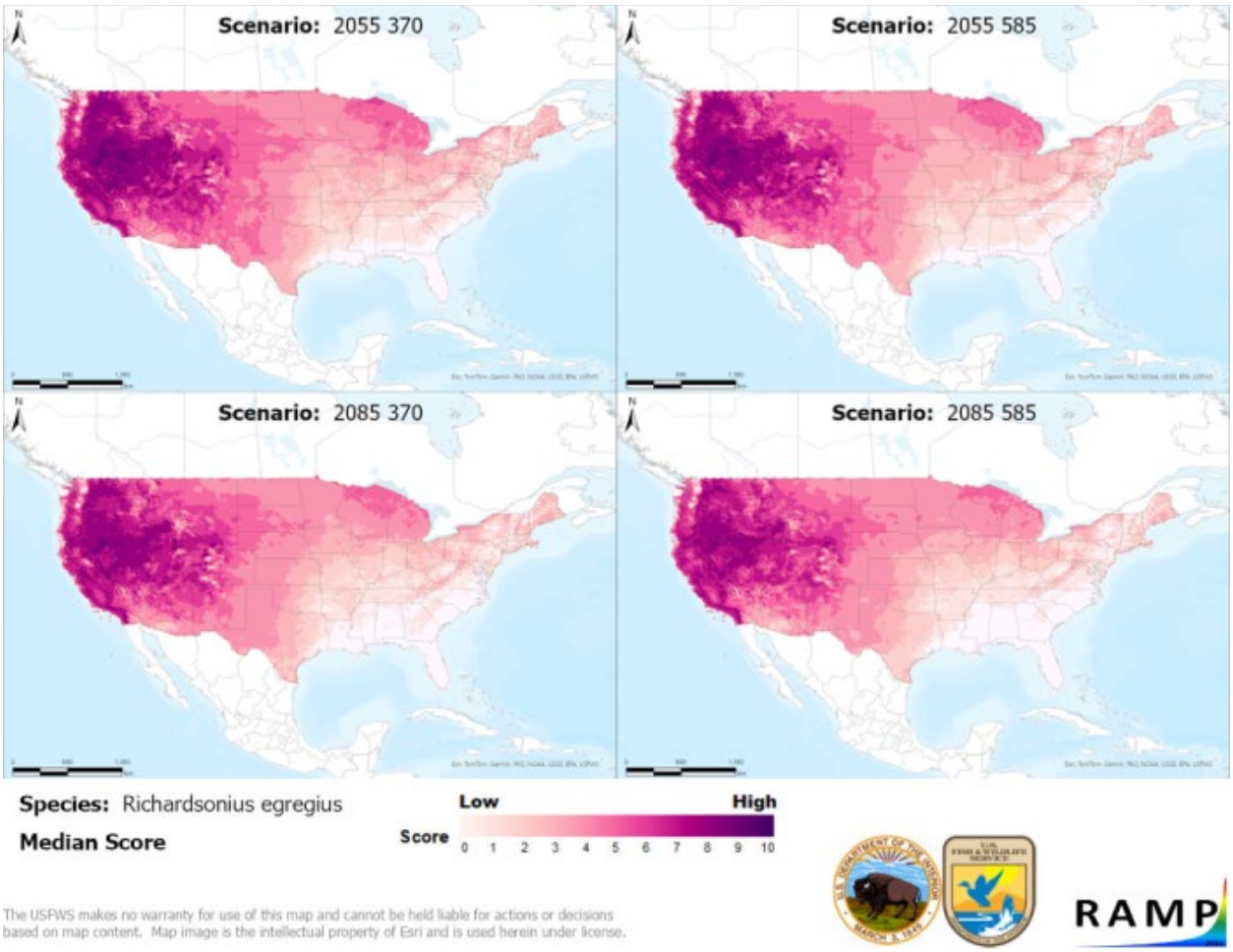

Figure A1. Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Richardsonius egregius* in the contiguous United States. Climate matching is based on source locations reported by GBIF Secretariat (2023). Shared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

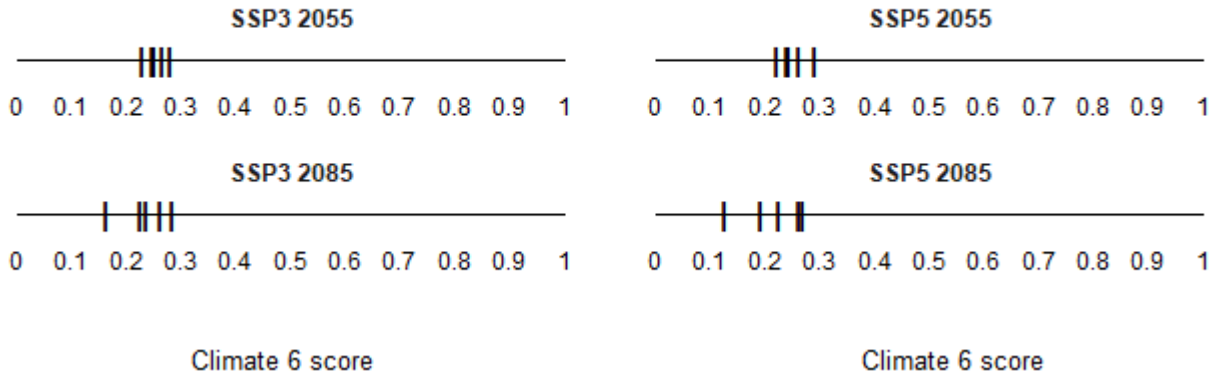

Figure A2. Comparison of projected future Climate 6 scores for *Richardsonius egregius* in the contiguous United States for each of five global climate models under four combinations of Shared Socioeconomic Pathway (SSP) and time step. SSPs used (from left to right): SSP3, SSP5 (Karger et al. 2017, 2018;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

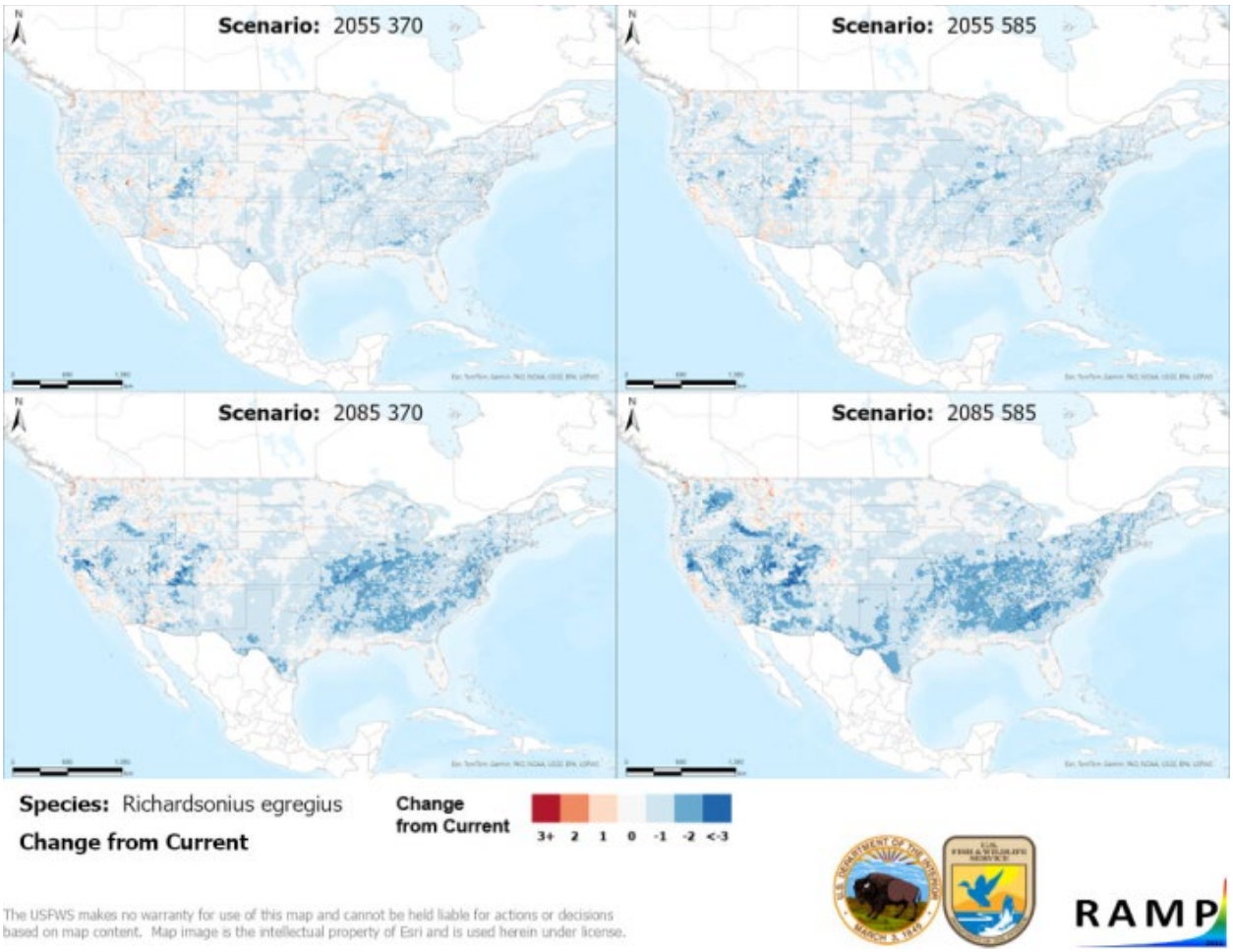

Figure A3. RAMP (Sanders et al. 2023) maps of the contiguous United States showing the difference between the current climate match target point score (figure 4) and the median target point score for future climate scenarios (figure A1) for *Richardsonius egregius* based on source locations reported by GBIF Secretariat (2023). 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. 2023. GBIF backbone taxonomy: *Richardsonius egregius* (Girard, 1858). Copenhagen: Global Biodiversity Information Facility. Available: https://www.gbif.org/species/2362394 (August 2025).

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