U.S. Fish & Wildlife Service

Bigscale Logperch (*Percina macrolepida*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2024
Revised, February 2024
Web Version, 7/22/2025

Organism Type: Fish
Overall Risk Assessment Category: Uncertain



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1 Native Range and Status in the United States

Native Range

From Fuller (2024):

"Native Range: From Sabine River, Louisiana, and Red River, Oklahoma, to Rio Grande drainage, Texas, New Mexico, and Mexico (Page and Burr 1991)."

Status in the United States

From NatureServe (2024):

"Native range is currently considered to extend from the Sabine River of Louisiana and Red River of Oklahoma and Arkansas to the Rio Grande drainage of Texas, New Mexico (Pecos

River), and Mexico (Buchanan and Stevenson 2003). Now widespread in the Arkansas River basin (mainly Arkansas and Oklahoma), but native/non-native status there is uncertain (Buchanan and Stevenson 2003). Records from the western Arkansas River basin in southeastern Colorado and northeastern New Mexico clearly represent introductions (Sublette et al. 1990, Fuller et al. 1999), and records from western Oklahoma likely also stem from introductions (Cashner and Matthews 1988, Fuller et al. 1999). Introduced in Sacramento-San Joaquin River drainage in central California; now widespread there and in reservoirs fed by California Aqueduct (Moyle 2002). Locally common, localized and uncommon in Rio Grande drainage (Page and Burr 1991)."

From Fuller (2024):

"Status: Established and expanding in California. Since its original introduction, the Bigscale Logperch has extended its range southward into the San Joaquin drainage (Farley 1972; Dill and Cordone 1997); and northward into the Yuba, Sacramento and Feather rivers (Boles 1976). Established in New Mexico, and presumably in Oklahoma. Probably extirpated in Colorado. Two Buttes Reservoir [Colorado] has been periodically dry since 1979 (C. Bennett, personal communication)."

From Jackson et al. (2020):

"A single specimen was collected during a routine survey of Cow Springs Lake [Arizona] on September 26, 2017, preliminarily identified as *Percina* sp., preserved, and retained for species identification. We verified the specimen was a Bigscale Logperch through genetic analysis. Review of published literature and the U.S. Geological Survey Nonindigenous Aquatic Species Database suggests that this is the first known occurrence of Bigscale Logperch in Arizona."

From Fofonoff et al. (2018):

"In addition to the Sacramento-San Joaquin watershed, the Bigscale Logperch have been introduced to scattered lakes and reservoirs in southern California, either with stocked fish or by the California Aqueduct System from the Delta (Swift et al. 1993)."

No records of *Percina macrolepida* 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 Fuller (2024):

"Means of Introduction: Unintentional. The Bigscale Logperch was introduced into California with contaminated stock from the Trinity River, Texas, in 1953 (Dill and Cordone 1997; Moyle 2002). These introductions were carried out by the U.S. Fish and Wildlife Service during intentional stocking of largemouth bass and bluegill (McKechnie 1966). This percid subsequently entered the Del Valle Reservoir, Alameda County, California, via the Tracy

pumping plant and the South Bay Aqueduct (Farley 1972; Moyle et al. 1974; Dill and Cordone 1997). It was introduced by bait bucket into New Mexico (Sublette et al. 1990). The Colorado introduction was the result of stock contamination of fishes transplanted from Texas prior to 1952 (Ellis 1974; Wiltzius 1985)."

Remarks

From Fuller (2024):

"Lee et al. (1980 et seq.) considered the Washita River, Oklahoma population to be native. They did not map the other Oklahoma sites. Specimens from Lake Optima, Oklahoma have not been positively identified but are reportedly logperch and well outside the native range of both *P. caprodes* and *P. macrolepida* (Cashner and Matthews 1988). Prior to 1976 many authors including Shapovalov et al. (1959), McKechnie (1966), Farley (1972), and Moyle et al. (1974), referred to introductions of this species and reported them as *P. caprodes*. Since that time *P. macrolepida* was described as distinct from *P. caprodes*. Sturgess (1976) determined the species in California was actually *P. macrolepida* and not *P. caprodes*. Moyle et al. (1974) and Moyle (2002) provided a map showing the range of the Bigscale Logperch in California and Dill and Cordone (1997) gave an overview of the species' history in that state."

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 Acanthopterygii
Order Perciformes
Suborder Percoidei
Family Percidae
Genus *Percina*
Species *Percina macrolepida* Stevenson, 1971

According to Fricke et al. (2024), *Percina macrolepida* Stevenson 1971 is the current valid name for this species.

Size, Weight, and Age Range

From Froese and Pauly (2024):

"Max length : 11.0 cm TL [total length] male/unsexed; [Page and Burr 1991]; common length : 7.0 cm TL male/unsexed; [Hugg 1996]"

From Fofonoff et al. (2018):

"[…] reaches 95–110 mm."

"This fish lives for up to 3 years (Moyle 2002)."

Environment

From NatureServe (2024):

"Habitat Type: Freshwater; Lacustrine Habitats: Shallow water; Riverine Habitats: High gradient, CREEK, Moderate gradient, Pool, MEDIUM RIVER, Low gradient, Riffle"

"Gravel and sand runs and pools of small to medium rivers. Prefers gravel raceway conditions of moderate to swift current, avoiding rubble riffles themselves. Also in rivers with low flow and can be abundant in impounded waters. Most abundant in mud-bottomed turbid sloughs in California"

From Froese and Pauly (2024):

"benthopelagic"

From Fofonoff et al. (2018):

"Its [*Percina macrolepida*] temperature tolerances have not been studied but based on its range, it probably tolerates fairly warm temperatures. In the San Francisco estuary, it has been collected at salinities as high as 4.2 PSU (California Fish Website 2018)."

According to Fofonoff et al. (2018), citing Matern et al. (2002), the minimum temperature tolerated by this species is 4.1°C and the maximum temperature tolerated is 29.5°C.

Climate

From Froese and Pauly (2024):

"Subtropical; 36°N - 29°N"

From Fofonoff et al. (2018):

"Warm temperate"

Distribution Outside the United States

Native

From NatureServe (2024):

"[…] Rio Grande drainage of […] Mexico (Buchanan and Stevenson 2003)."

Part of the native range for this species is within the United States, see section 1 for a complete description of the native range.

Introduced

No records were found of introduction of *Percina macrolepida* in the wild outside the United States.

Means of Introduction Outside the United States

No records were found of introduction of *Percina macrolepida* in the wild outside the United States.

Short Description

From Fofonoff et al. (2018):

"The Bigscale Logperch (*Percina macrolepida*) has scales on the nape, and on top of the head (absent in some other logperches and 77–70 lateral line scales), […] The fish is light olive above, fading to yellow below, with 15–20 dark bars along the side, and a clear or yellow spiny dorsal fin (Page and Burr 1991)."

From Kaller et al. (2013):

"This perch can only be distinguished from *P. caprodes* by critical examination of the number of lateral bars (*P. macrolepida* have fewer bars than *P. caprodes*). The bigscale logperch differs further in lacking the submarginal yellow-orange band in the first dorsal fin and the subocular bar."

Biology

From NatureServe (2024):

"Ripe females found late February to mid-April in central Texas (Hubbs 1985). Larvae were collected in Lake Texoma (Oklahoma-Texas) from March to late May."

"In Texas, adhesive eggs were attached to stems or leaves of aquatic macrophytes (Simon and Kaskey 1992). Larvae drift into quiet water in lotic environments."

"Feeds opportunistically on insect larvae, also amphipods and planktonic crustaceans (Moyle 1976). Larvae initially obligate planktivores."

From Fofonoff et al. (2018):

"[…] it [*Percina macrolepida*] has only a small swimbladder and is not capable of sustained swimming. […] They are often seen sitting on logs, hence the common name (Page and Burr 1991; Moyle 2002). Adults feed by using their projecting snout to overturn pebbles and sticks, and making quick dashes to grab prey in the water column. Their prey includes copepods, cladocerans, amphipods, mysids, and insect larvae (Moyle 2002)."

"Spawning is unusual, in that the female displays and chooses the location, by standing on her tail, depositing the eggs on the stems of aquatic plants. Eggs are laid in small batches of 10-20 eggs on aquatic vegetation, or in shallow pits excavated in the substrate. Total fecundity is 150 to 400 eggs (Wang 1986; Moyle 2002). The eggs are not guarded, and the hatched larvae are free-swimming and drift downstream, and feed on zooplankton, until they settle (Wang 1986)."

Human Uses

No information was found on human uses of *Percina macrolepida*.

Diseases

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

Poelen et al. (2014) lists *Percina macrolepida* as a host to the tapeworm *Ligula intestinalis*.

Threat to Humans

From Froese and Pauly (2024):

"Threat to humans: Harmless."

3 Impacts of Introductions

From Fuller (2024):

"Impact of Introduction: Largely unknown. The species reportedly feed on eggs of centrarchids (Moyle et al. 1974)."

From Fofonoff et al. (2018):

"No ecological or economic impacts have been reported for the Bigscale Logperch (*Percina macrolepida*) in its native or introduced ranges."

4 History of Invasiveness

The History of Invasiveness for *Percina macrolepida* is classified as Data Deficient. There are records of nonnative introductions that have resulted in established populations of *Percina macrolepida* outside its native range. No impacts of those introductions have been documented, but there is also little evidence of research done to determine if any impacts are occurring.

5 Global Distribution



Figure 1. Reported global distribution of *Percina macrolepida*. Map from GBIF Secretariat (2023). Observations are reported from the south-central United States and California. Some reported observations in California, Colorado, Mississippi, and Oklahoma were not used to select source points for the climate matching analysis because they do not represent known established populations; see figure 2.

6 Distribution Within the United States



Figure 2. Reported distribution of *Percina macrolepida* in the United States. Map from USGS (2025). Orange shading represents the native range of the species. Yellow points represent established nonnative populations. Orange points represent introductions for which establishment has not been confirmed; these points were not used to select source points for the climate matching analysis. Additionally, according to Fuller (2024), the species is probably extirpated in Colorado, with no observations reported since 1988, so the point in northern Colorado was not used to select source points for the climate matching analysis.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Percina macrolepida* to the contiguous United States was highest within the established range of this species: California, southeastern New Mexico, Oklahoma, Texas, Arkansas, and Louisiana. The climate match was also high throughout the Southern Plains, southern Midwest, Southeast, and Gulf Coast. Other parts of the Southwest and the Pacific coast showed a mix of medium and high climate matches. The lowest matches were recorded in southern Florida, in the Rocky Mountains, and on the Olympic Peninsula and Cascade Range in the Pacific Northwest. The rest of the country had medium matches. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.851, indicating that Yes, there is establishment concern 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 *Percina macrolepida* (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.

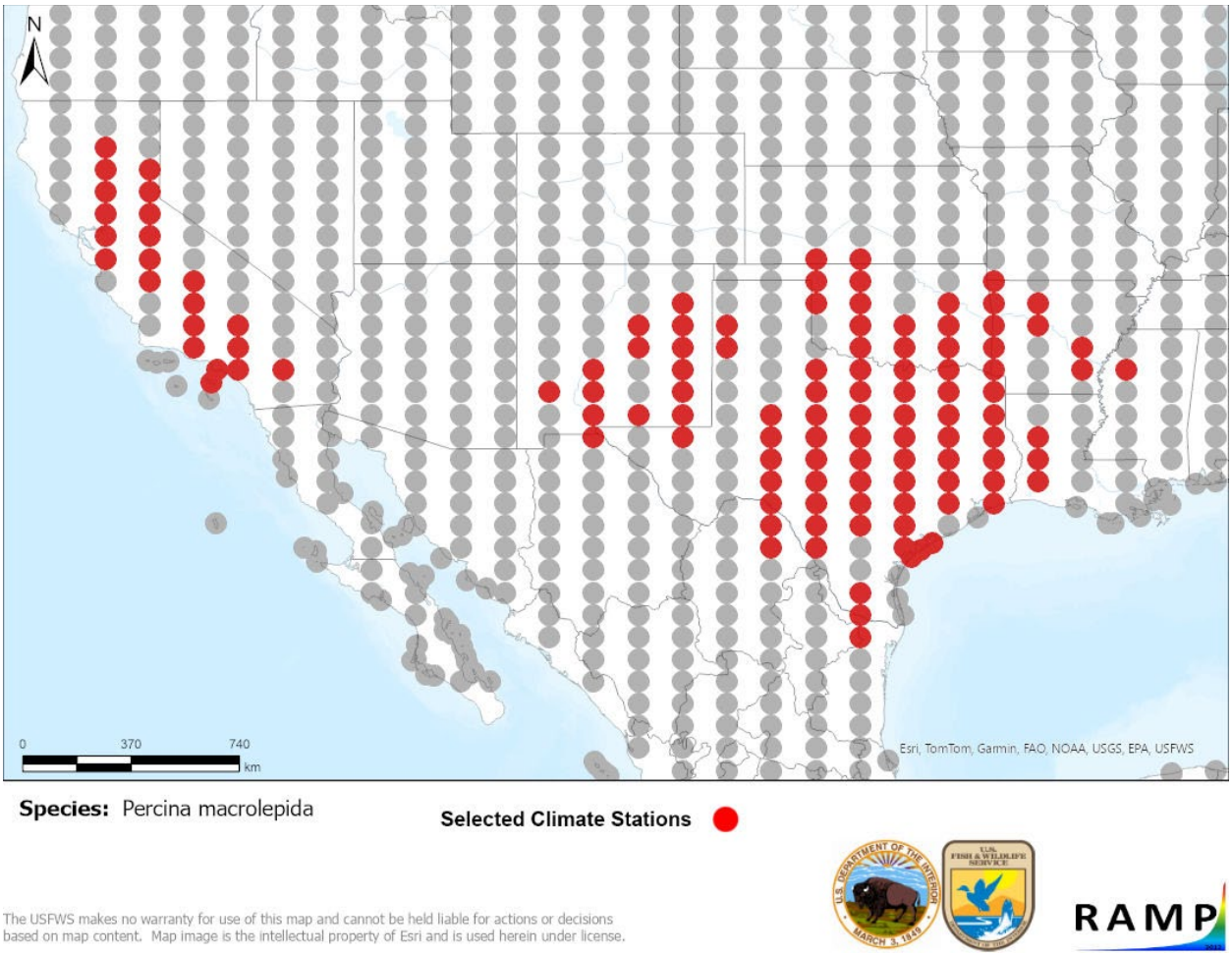


Figure 3. RAMP (Sanders et al. 2023) source map showing weather stations in the southern and western United States and northern Mexico selected as source locations (red; U.S. States of California, New Mexico, Kansas, Oklahoma, Texas, Louisiana, Arkansas, Mississippi; Mexico) and non-source locations (gray) for *Percina macrolepida* climate matching. Source locations from GBIF Secretariat (2023) and USGS (2025). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

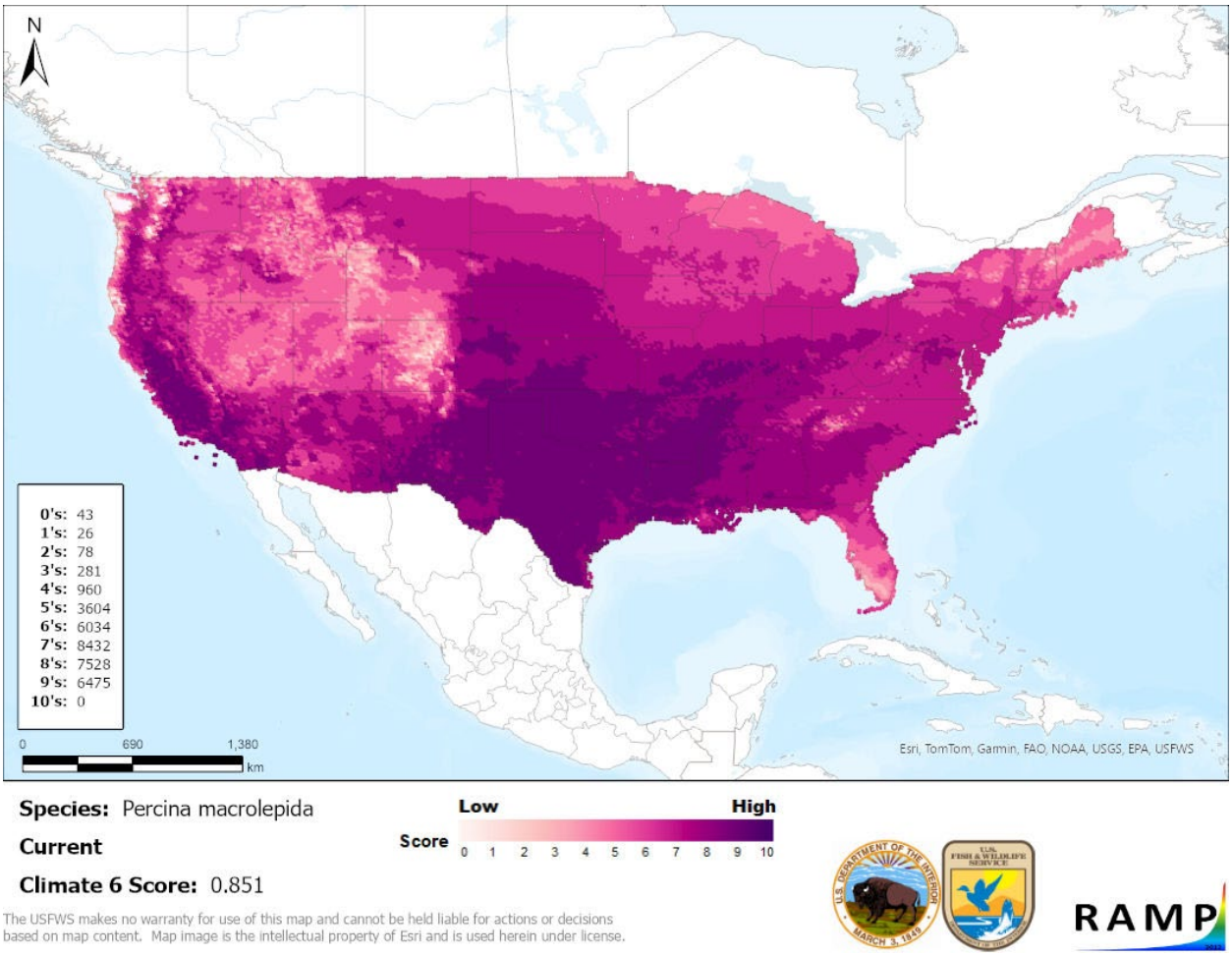


Figure 4. Map of RAMP (Sanders et al. 2023) climate matches for *Percina macrolepida* in the contiguous United States based on source locations reported by GBIF Secretariat (2023) and USGS (2025). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

8 Certainty of Assessment

The Certainty of Assessment for *Percina macrolepida* is classified as Low. Populations in the introduced range have not been studied to determine the existence of any impacts of introductions. Additionally, although current distribution information is relatively complete, there are parts of the range for which the status of *P. macrolepida* as native or nonnative is unclear.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Percina macrolepida, Bigscale Logperch, is a fish native to drainages in Arkansas, Louisiana, New Mexico, Oklahoma, Texas, and Mexico. It has been introduced and become established in California and in several areas peripheral to its native range in the south-central United States. *Percina macrolepida* is a freshwater species that prefers high gradient, medium-sized rivers. The

History of Invasiveness for *Percina macrolepida* is classified as Data Deficient due to little information available on any impacts of introductions. The climate matching analysis for the contiguous United States indicates establishment concern for this species outside its native range. High or medium climate matches occurred throughout most of the contiguous United States, with a particularly high match in areas where *P. macrolepida* is native or currently established. The Certainty of Assessment for this ERSS is classified as Low due primarily to the lack of information available on impacts of introductions. The Overall Risk Assessment Category for *Percina macrolepida* 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) and USGS (2025).

Under the future climate scenarios (figure A1), on average, high climate match for *Percina macrolepida* was projected to occur in the Appalachian Range, California, Great Lakes, Great Plains, Mid-Atlantic, Southeast, and Southwest regions of the contiguous United States. Under all scenarios, low climate matches were only notable in parts of the Great Basin, Northern Pacific Coast, Southern Florida, and Western Mountain regions. The Climate 6 scores for the individual future scenario models (figure A2) ranged from a low of 0.885 (model: MPI-ESM1-2-HR, SSP5, 2085) to a high of 0.922 (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 (0.851, 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 (figure A3). Primarily under the SSP5, 2085 scenario, areas within the Great Lakes and Northeast saw a large increase in the climate match relative to current conditions. Under other scenarios, the Great Lakes and Northeast regions had a moderate increase in climate match relative to current conditions. Additionally, areas within the Colorado Plateau, Great Basin, Northern Plains, Southwest, and Western Mountains saw a moderate increase in the climate match relative to current conditions. These changes were most pronounced under the SSP5, 2085 scenario except in the Southwest, where the change was least extreme under that scenario. At the 2085 time step, areas within north-central California saw a large decrease in the climate match relative to current conditions. Additionally, at the 2085 time step, areas of the Northern Pacific Coast, Southeast, Southern Plains, Southwest, and Western Mountains saw a moderate decrease in the climate match relative to current conditions. Moderate decrease in climate match was projected for parts of the Gulf Coast region under all scenarios. Additional, very small areas of large or moderate change may be visible on the maps (figure A3).

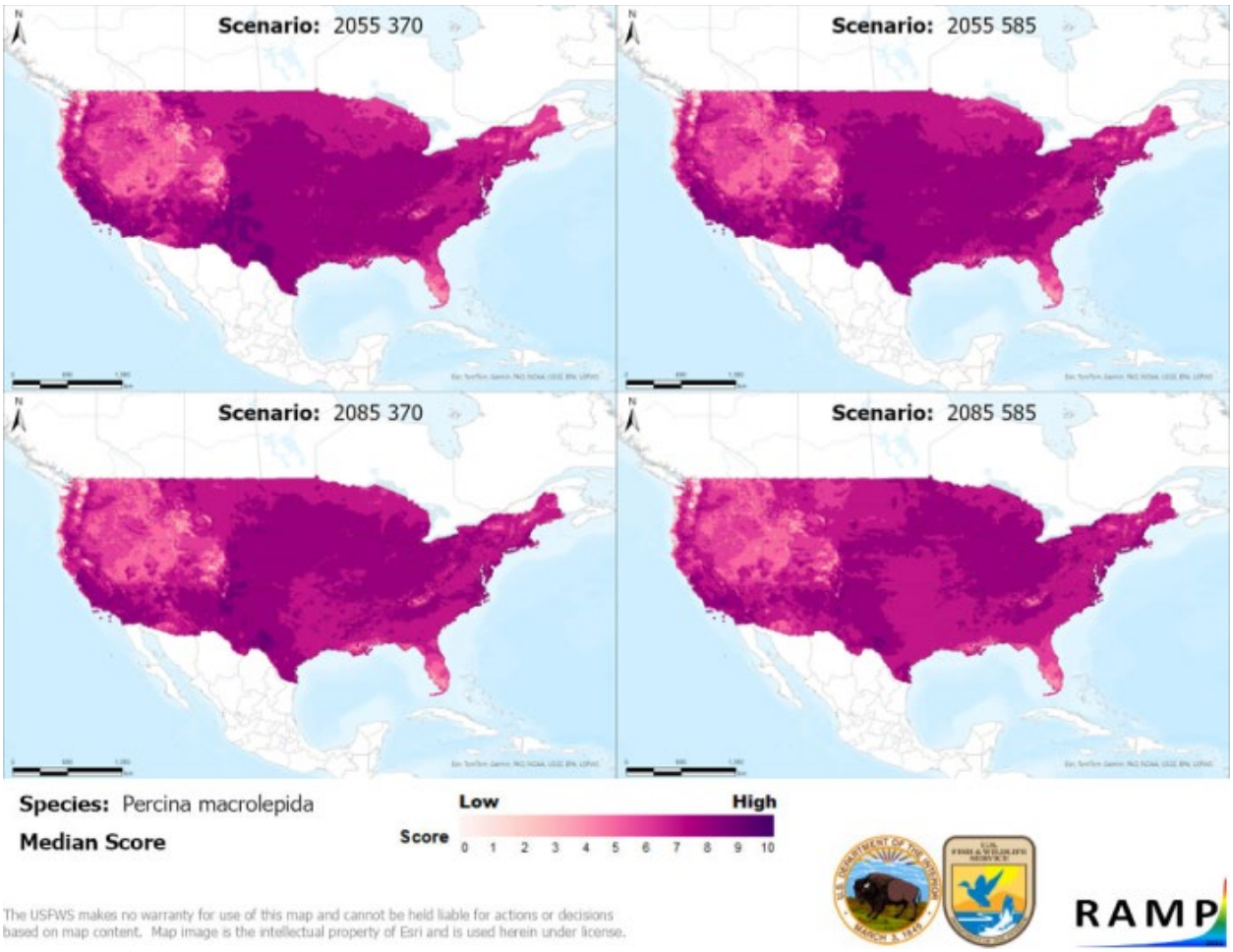


Figure A1. Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Percina macrolepida* in the contiguous United States. Climate matching is based on source locations reported by GBIF Secretariat (2023) and USGS (2025). 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.

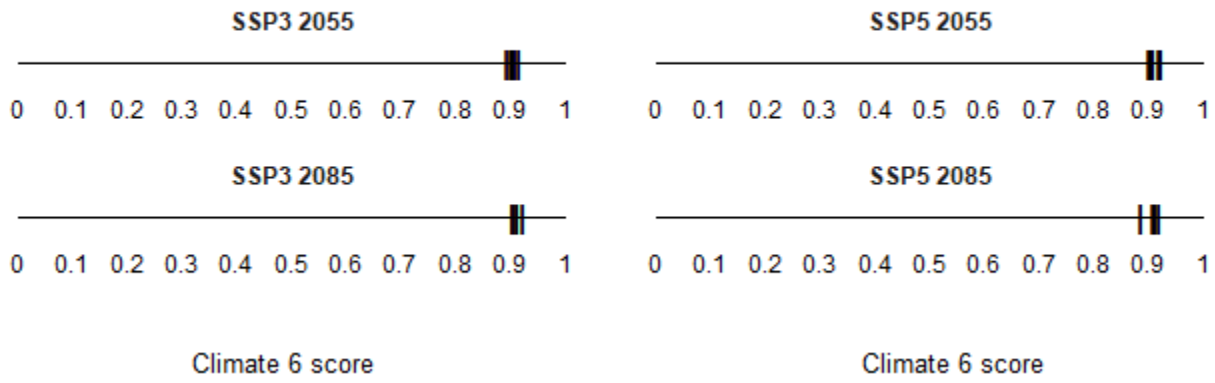


Figure A2. Comparison of projected future Climate 6 scores for *Percina macrolepida* in the contiguous United States for each of five global climate models under four combinations of Shared Socioeconomic Pathway (SSP) and time step. SSPs used (from left to right): SSP3, SSP5 (Karger et al. 2017, 2018;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

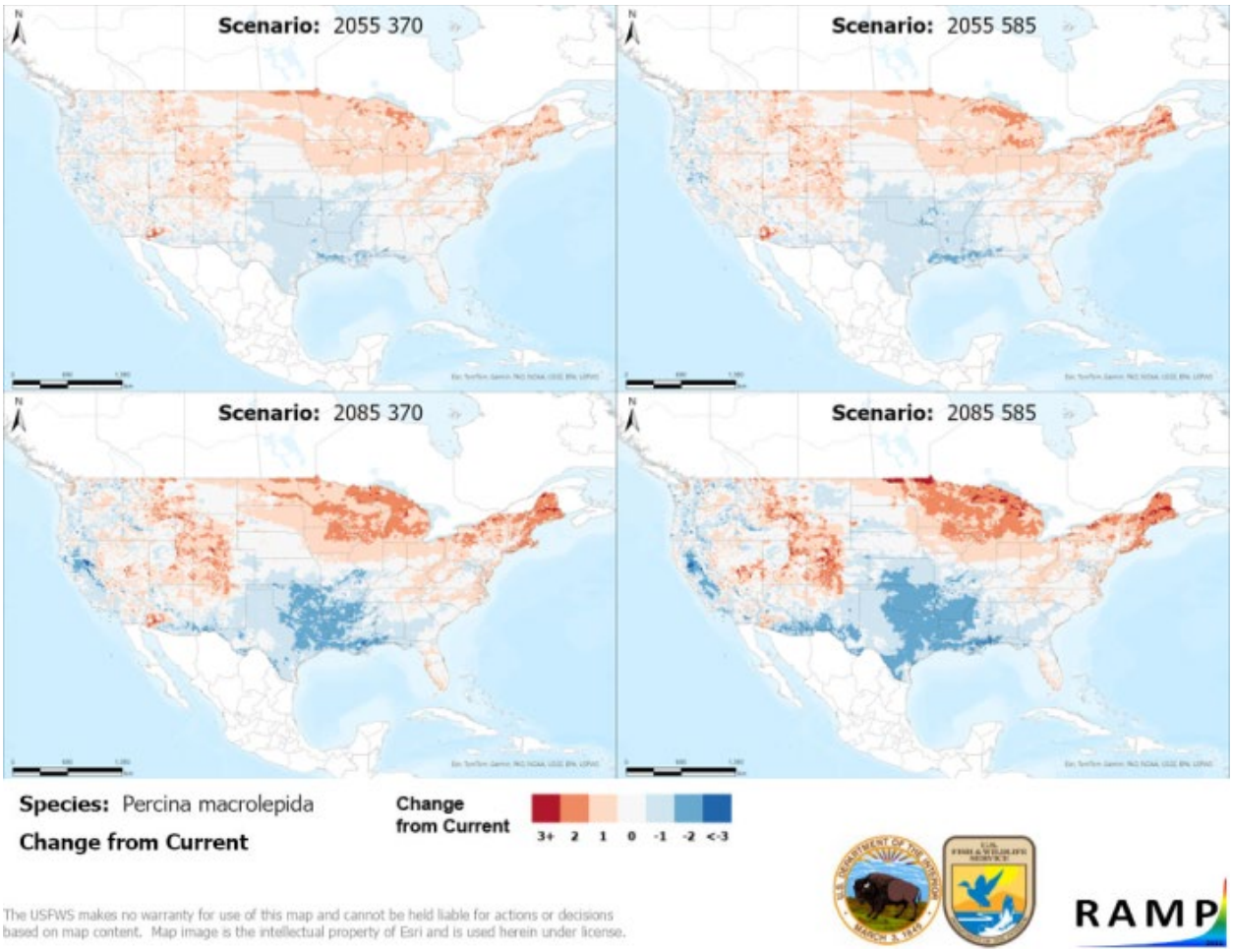


Figure A3. RAMP (Sanders et al. 2023) maps of the contiguous United States showing the difference between the current climate match target point score (figure 4) and the median target point score for future climate scenarios (figure A1) for *Percina macrolepida* based on source locations reported by GBIF Secretariat (2023) and USGS (2025). 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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