# Brown Hoplo (*Hoplosternum littorale*)

## Ecological Risk Screening Summary

**U.S. Fish and Wildlife Service, March 2024**
**Revised, January 2025**
**Web Version, 2/4/2026**

Organism Type: Fish
Overall Risk Assessment Category: Uncertain

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# 1 Native Range and Status in the United States

## Native Range

From Nico et al. (2026):

"Tropical America. Occurs in Trinidad, and is widespread in South America east of the Andes and north of Buenos Aires, including the Rio Orinoco, coastal rivers of the Guianas, Rio

Amazonas basin, Rio Paraguay, lower Rio Parana and coastal systems in southern Brazil (Reis 1997)."

From Allen (2019):

"Over its native range, this species occurs in lowland areas of Trinidad, Guyana, Suriname, French Guiana, Bolivia, Paraguay, Argentina and Brazil (Nico et al., 1996)."

## Status in the United States

From Froese and Pauly (2019):

"Introduced in the USA [Orfinger 2015]."

From Nico et al. (2026):

"Established in Florida (Nico et al. 1996), this species has expanded its range throughout peninsular Florida, as far north as the Jacksonville area in Duval County."

Nico et al. (2026) also report nonindigenous occurrences of *Hoplosternum littorale* in Georgia with unknown establishment status.

*Hoplosternum littorale* is available in the pet trade in the United States (e.g., Imperial Tropicals 2025; Live Aquaponics 2025; Wet Spot Tropical Fish 2025), although no estimates of trade volume were available.

### Regulations

*Hoplosternum littorale* is regulated in Hawaii.(Hawaii Department of Agriculture 2019) and North Carolina (North Carolina Department of Environmental Quality 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 Nico et al. (2026):

"Unknown. Possibly released food fish, aquarium release, or escape from aquaculture ponds. Expanded range around Florida may have been assisted by humans to establish both commercial and subsistence fisheries (Gestring et al. 2009)."

"A small commercial and recreational castnet fishery for *H. littorale* has commenced in Florida, which is a popular food fish in its native range. Part of the species' rapid expansion throughout peninsular Florida may have resulted from illegal movement by castnet fishermen to enhance local fisheries (Gestring et al. 2009)."

## Remarks

This ERSS was previously published in November 2019. Revisions were completed to incorporate new information and conform to updated standards.

Mention of commercial products in this Ecological Risk Screening Summary does not entail endorsement by the U.S. Federal Government.

# 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 Siluriformes
Family Callichthyidae
Subfamily Callichthyinae
Genus *Hoplosternum* Gill, 1858
Species *Hoplosternum littorale* (Hancock, 1828)

According to Fricke et al. (2025), *Hoplosternum littorale* is the current valid name for this species.

## Size, Weight, and Age Range

From Froese and Pauly (2024):

"Maturity: $L_m$ [length at maturity] 16.7 […] cm
Max length : 26.3 cm TL [total length] male/unsexed; [Orfinger 2015]; max. reported age: 4 years [Meunier et al. 2002]"

## Environment

From Froese and Pauly (2024):

"Freshwater; demersal; depth range 1 - ? m [Kenny 1995]. […] 18°C - 26°C [Baensch and Riehl 1985; assumed to be recommended aquarium temperature] […]"

From Nico et al. (2026):

"*Hoplosternum littorale* is typically found in a variety of freshwater habitats, including slow-moving rivers, canals, streams, and pools (Nico et al. 1996; Gestring et al. 2009)."

## Climate

From Froese and Pauly (2024):

"Subtropical; […] 11°N - 37°S"

## Distribution Outside the United States

### Native

From Nico et al. (2026):

"Tropical America. Occurs in Trinidad, and is widespread in South America east of the Andes and north of Buenos Aires, including the Rio Orinoco, coastal rivers of the Guianas, Rio Amazonas basin, Rio Paraguay, lower Rio Parana and coastal systems in southern Brazil (Reis 1997)."

From Allen (2019):

"Over its native range, this species occurs in lowland areas of Trinidad, Guyana, Suriname, French Guiana, Bolivia, Paraguay, Argentina and Brazil (Nico et al., 1996)."

### Introduced

From Lima and Latini (2016):

"This species [*Hoplosternum littorale*] does not occur naturally in the basins of Eastern Brazil (Oliveira & Moraes Júnior 1997) and was introduced in the 1990s […]."

## Means of Introduction Outside the United States

From Lima and Latini (2016):

"This species [*Hoplosternum littorale*] […] was introduced [to eastern Brazil] in the 1990s after the introductions of *P. nattereri* and *C. kelberi* (Latini et al. 2004), probably as a bait for fishing in the Lakes District of the Rio Doce Basin (Latini et al. 2004)."

## Short Description

From Allen (2019):

"*H. littorale* has a bony armour consisting of two rows of large hard scales forming plate-like armour along each side; dark brown to black in colour with two pairs of long barbels on the chin. The barbels are used to detect the presence of food. Breeding males possess enlarged bright red pectoral spines, with hooks at the tips, which are used as weapons in aggressive territorial bouts

(Nico et al., 1996). Eyes are not well developed. […] Males grow to a maximum of 200 mm and females to about 150 mm. As the gills are underdeveloped in *H. littorale*, gill breathing is supplemented by its ability to breath air via the intestinal epithelia (Boujard et al., 1990; Ramnarine, 1994a, b; Brauner et al., 1995; Nico et al., 1996)."

## Biology

From Froese and Pauly (2024):

"Inhabits swamps [Kenny 1995]. During the rainy season, adults consume a great quantity of chironomids associated with detritus. During the dry season, they feed mostly on terrestrial insects, micro-crustaceans, aquatic Diptera, and detritus. Absorbs a great quantity of anaerobic bacteria from the substrate [Boujard et al. 1997]. First reproduction occurs after one year [Le Bail et al. 2000]."

From Nico et al. (2026):

"This species is a facultative air breather, an adaptation that allows it to colonize and survive in habitats with low dissolved oxygen (Winemiller 1987; Brauner et al. 1995), such as the seasonal wetlands of the Florida peninsula (Kline et al. 2013). This species is a benthic scavenger, primarily consuming benthic microcrustaceans (e.g., cladocerans, ostracods), aquatic insect larvae, detritus, and plant matter (Winemiller 1987; Gestring et al. 2009)."

"Brown hoplos are sexually dimorphic, with males larger than females and possessing enlarged pectoral fin spines and adjacent fat deposits during the reproductive season. These enlarged spines are used in aggressive or defensive encounters (Winemiller 1987; Hostache and Mol 1998). Nico and Muench (2004) describe nesting habits of this species in Florida. Spawning season in Florida occurrs from May to September, coinciding with the rainy season and generally higher water levels and temperatures, and similar to the timing of the reproductive season in the native range (Winemiller 1987). Numbers of bubble nests and gonadosomatal indices (GSI) for both males and females peak in August-September (Nico and Muench 2004; Gestring et al. 2009)."

## Human Uses

From Froese and Pauly (2024):

"Used to be cultured commercially in Guyana [FAO 1993]. Cultured in Trinidad on a semi-commercial scale [Kenny 1995]."

From Nico et al. (2026):

"A small commercial and recreational castnet fishery for *H. littorale* has commenced in Florida, which is a popular food fish in its native range."

## Diseases

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

No information was found on diseases associated with *Hoplosternum littorale*.

## Threat to Humans

From Froese and Pauly (2024):

"Harmless"

# 3 Impacts of Introductions

From Nico et al. (2026):

"Largely unknown. In several Florida water bodies, this species is locally abundant; because it feeds heavily on benthic invertebrates and detritus, the species had negative effects on the benthic invertebrate communities, possibly competing with native fishes when prey are limited (Duxbury et al. 2010)."

From Duxbury et al. (2010):

"We used enclosure cages (n = 10) to test the effects of fish [*Hoplosternum littorale*] on macroinvertebrates. The experimental design included two treatments: fish and a control with no fish, with five replicates per treatment. […] Cages were secured to the stream bottom with metal stakes."

"Prior to the start of the experiment (October 2005), we caught the hoplo catfish from the study stream using a cast net. We then placed two catfish into each fish-treatment cage."

"Our results suggest that hoplo catfish impact aquatic macroinvertebrate assemblages on artificial substrates. We found that macroinvertebrate abundances and taxa richness on MAS [macroinvertebrate artificial substrates] in cages with fish were significantly reduced by about 30 and 50%, respectively […]."

*Hoplosternum littorale* is regulated in Hawaii and North Carolina (Hawaii Department of Agriculture 2019; North Carolina Department of Environmental Quality 2022). See section 1.

# 4 History of Invasiveness

*Hoplosternum littorale* has been introduced and become established throughout peninsular Florida and southeastern Brazil. No documented impacts from introductions were found. However, the species has become abundant in some localities and a mesocosm experiment showed presence of *H. littorale* was negatively correlated with macroinvertebrate abundance and richness in enclosures. *H. littorale* is used as a food source in Florida and supports a small fishery. The History of Invasiveness for *Hoplosternum littorale* is classified as Data Deficient.

# 5 Global Distribution

**Figure 1.** Reported global distribution of *Hoplosternum littorale*. Map from GBIF Secretariat (2023). Observations are reported from United States (Florida and Georgia) and South America. The point in Martinique is a record of one individual reported, is not considered representative of an established population, and was not used in the climate matching analysis. The coordinates for the southernmost point in Argentina are for the country centroid and not where the observation occurred; the point was also not use in the climate matching analysis.

# 6 Distribution Within the United States

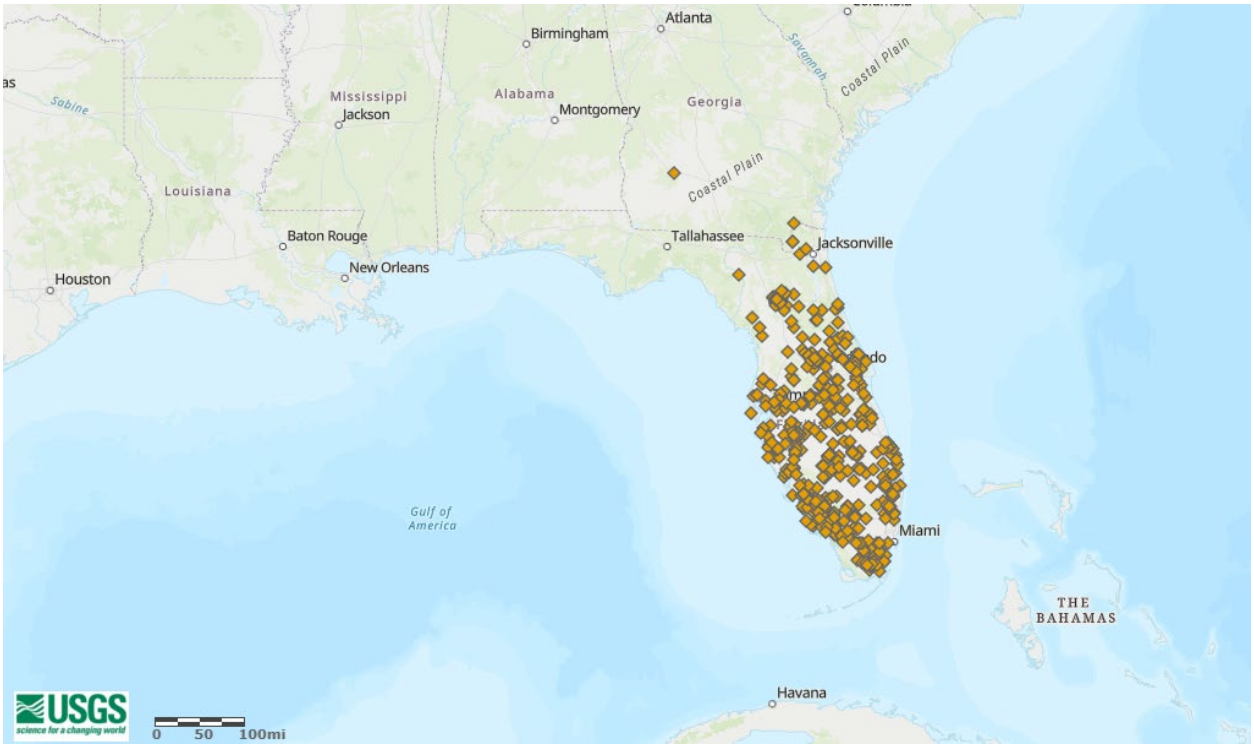


**Figure 2.** Reported distribution of *Hoplosternum littorale* in the United States. Map from Nico et al. (2026). Observations are reported from Florida and Georgia. The observations in Georgia do not represent an established population and were not used in the climate matching analysis.

# 7 Climate Matching

## Summary of Climate Matching Analysis

On average, the climate match for *Hoplosternum littorale* to the contiguous United States was high across portions of the Gulf Coast, Southern Atlantic Coast, and Southern Florida regions. Areas of low climate matches were observed in portions of the Great Basin, Northern Pacific Coast, and Western Mountains regions. Much of the area from southeastern Arizona to the southern Great Lakes and New England had medium climate matches. The majority of the United States, not specified above, had a medium climate match. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.407, indicating that 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 *Hoplosternum littorale* (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.

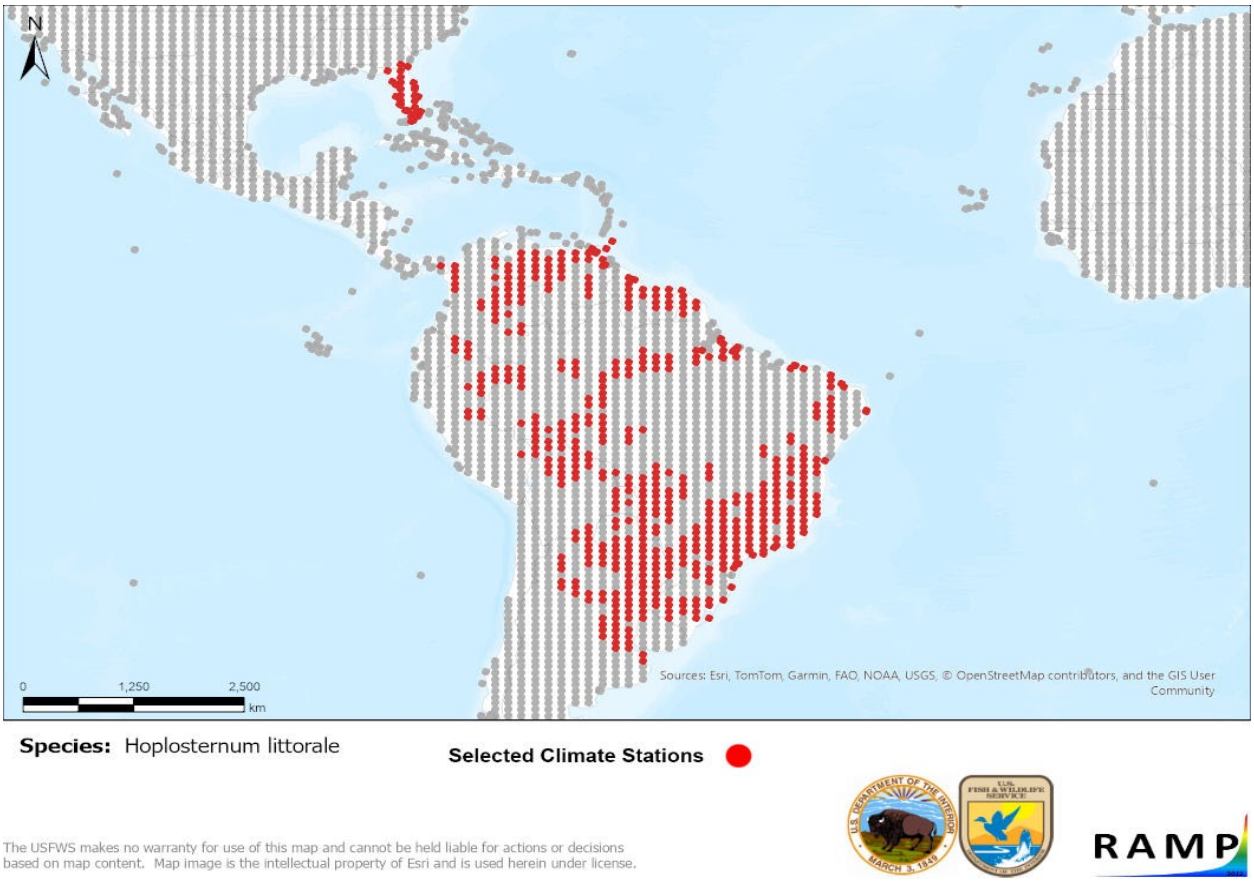


**Figure 3.** RAMP (Sanders et al. 2023) source map showing weather stations in South America and United States (Florida and Georgia) selected as source locations (red; Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Panama, Paraguay, Peru, Suriname, United States [Florida], Trinidad and Tobago, Uruguay, and Venezuela) and non-source locations (gray) for *Hoplosternum littorale* climate matching. Source locations from GBIF Secretariat (2023). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

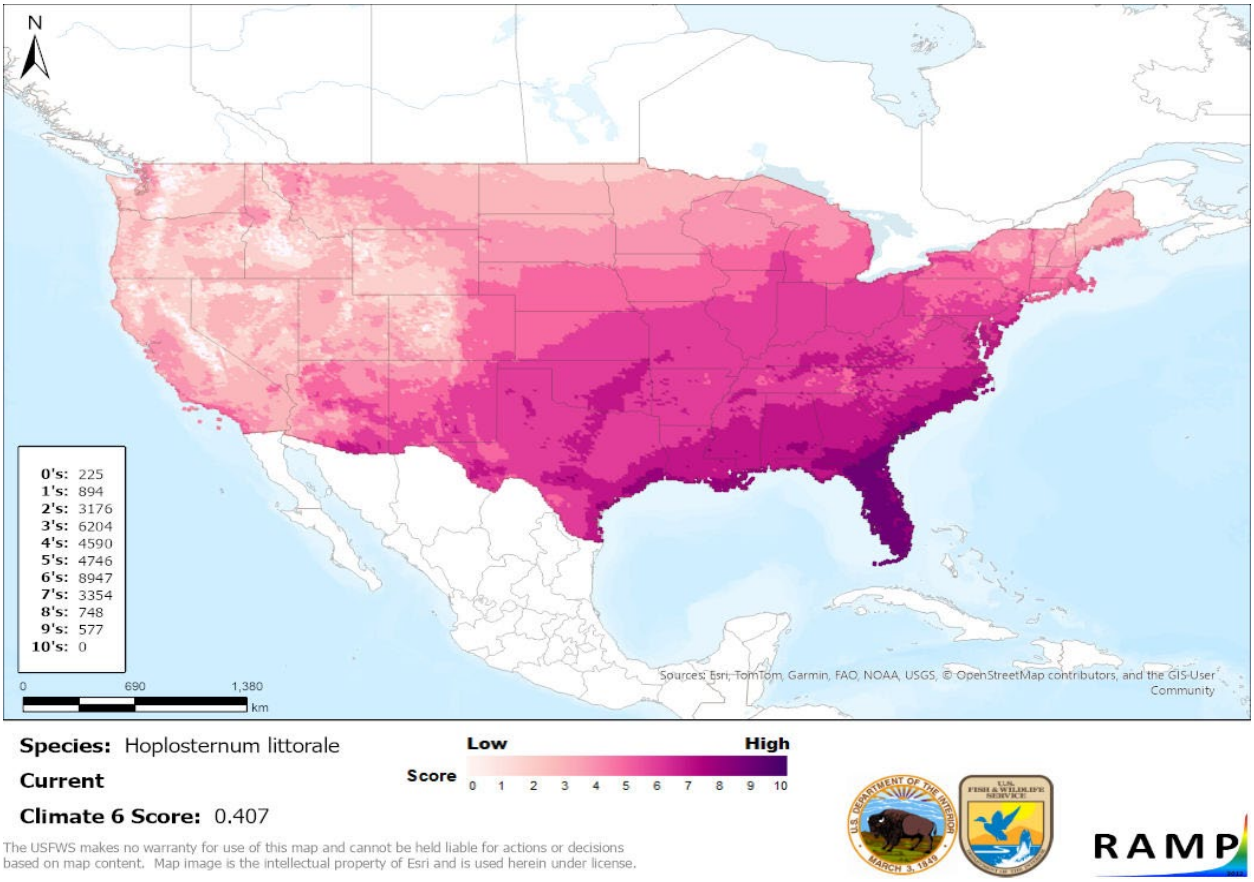


**Figure 4.** Map of RAMP (Sanders et al. 2023) climate matches for *Hoplosternum littorale* in the contiguous United States based on source locations reported by GBIF Secretariat (2023). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

# 8 Certainty of Assessment

The certainty of assessment for *Hoplosternum littorale* is classified as Low. The biology, ecology, and distribution are well documented. Records of introduction and resulting establishment were available. Information on documented impacts from introductions was not available, although some information indicated the potential for negative impacts.

# 9 Risk Assessment

## Summary of Risk to the Contiguous United States

*Hoplosternum littorale,* brown hoplo, is a fish that is native to much of South America. This fish is a facultative air breather which allows it to survive in areas with degraded environmental conditions. *H. littorale* is present in the aquarium trade and is used as a food source. Those human uses have resulted in introductions and establishment throughout Florida. *H. littorale* has also been introduced and become established outside its native range in Brazil. There is suggestion that nonnative populations of *H. littorale* have the potential to cause negative impacts but none are yet reported from the wild. One experimental study did find a negative correlation between the presence of *H. littorale* and reductions in macroinvertebrate richness and abundance.

The History of Invasiveness for *Hoplosternum littorale* is classified as Data Deficient. The climate matching analysis for the contiguous United States indicates establishment concern for this species. Much of the contiguous United States had a medium climate match for *Hoplosternum littorale*, and the coastal southeastern United States had a high climate match. The Certainty of Assessment for this ERSS is classified as Low due to lack of information regarding impacts from introduced populations. The Overall Risk Assessment Category for *Hoplosternum littorale* 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 *Hoplosternum littorale* was projected to occur in the Southern Atlantic Coast and Southern Florida regions of the contiguous United States. Areas of low climate match were projected to occur in the Great Basin and Western Mountains regions. The Climate 6 scores for the individual future scenario models (figure A2) ranged from a low of 0.230 (model: MPI-ESM1-2-HR, SSP5, 2085) to a high of 0.495 (model: MRI-ESM2-0, SSP3, 2085). All future scenario Climate 6 scores were above the Establishment Concern threshold, indicating that Yes, there is an Establishment Concern for this species. The Climate 6 score for the current climate match (0.407, 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 (figure A3). Primarily under the 2085 time step, areas within the Great Lakes and Northeast saw a large increase in the climate match relative to current conditions. Additionally, under one or more time step and climate scenarios, areas within the Appalachian Range, Colorado Plateau, Northern Pacific Coast, Northern 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, Southern Florida, and Southern Plains 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).

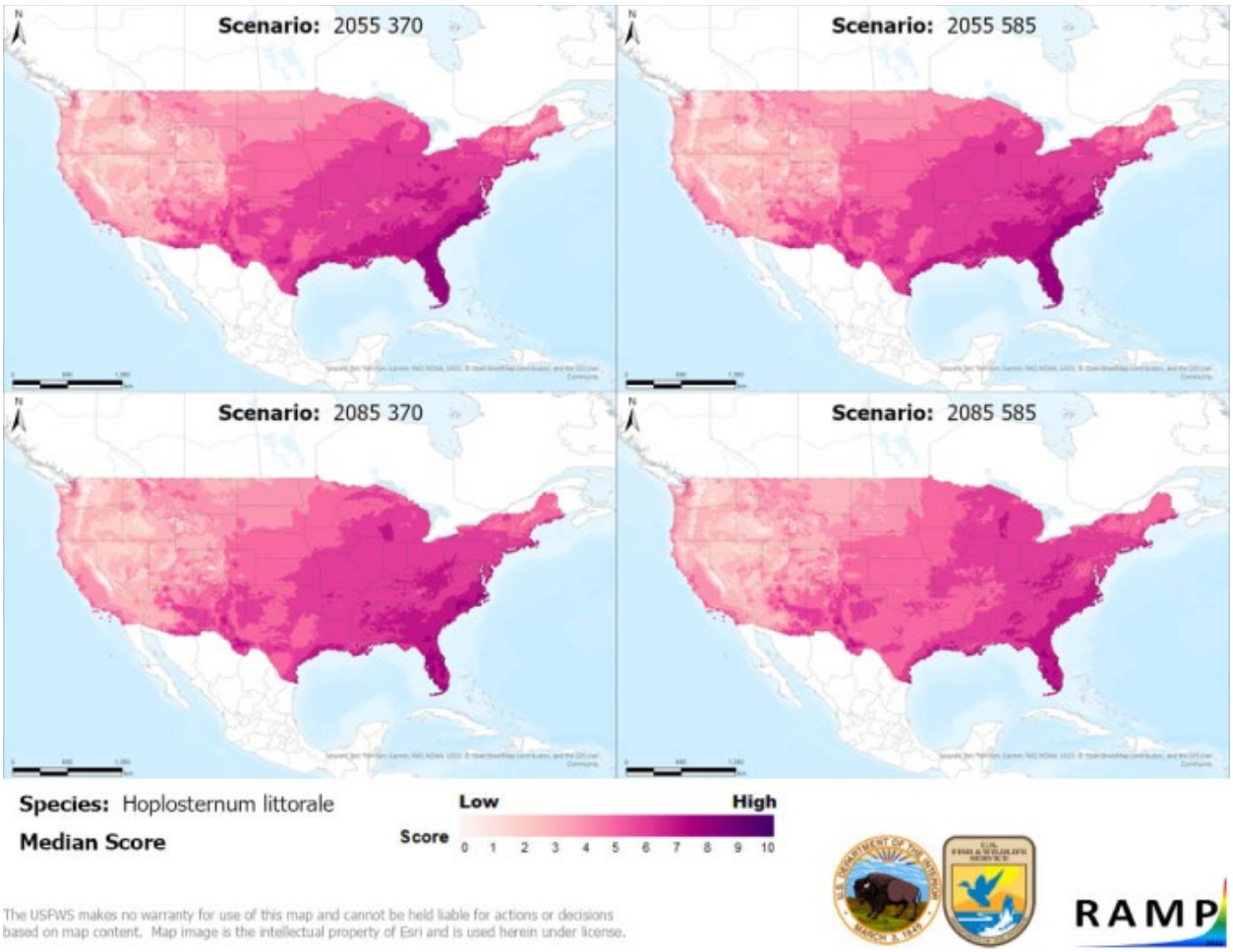


**Figure A1.** Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Hoplosternum littorale* in the contiguous United States. Climate matching is based on source locations reported by GBIF Secretariat (2023).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

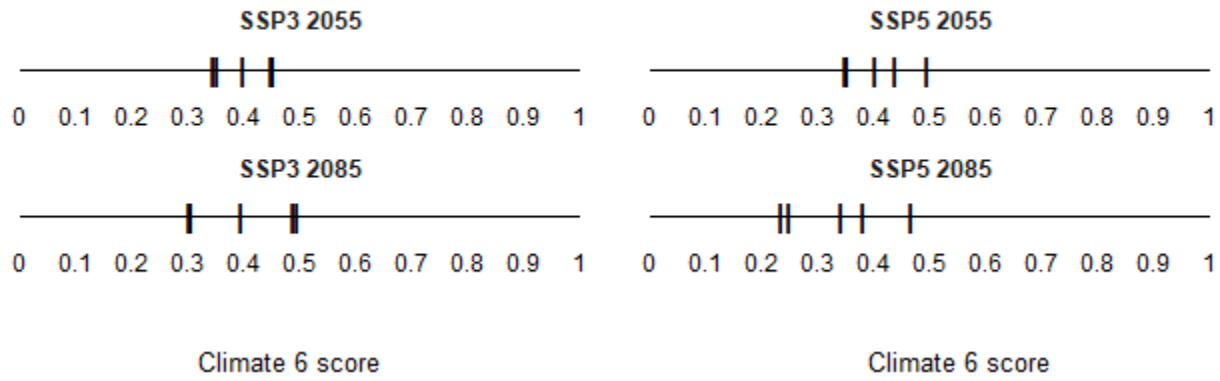


**Figure A2.** Comparison of projected future Climate 6 scores for *Hoplosternum littorale* in the contiguous United States for each of five global climate models under four combinations of Shared Socioeconomic Pathway (SSP) and time step. SSPs used (from left to right): SSP3, SSP5 (Karger et al. 2017,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

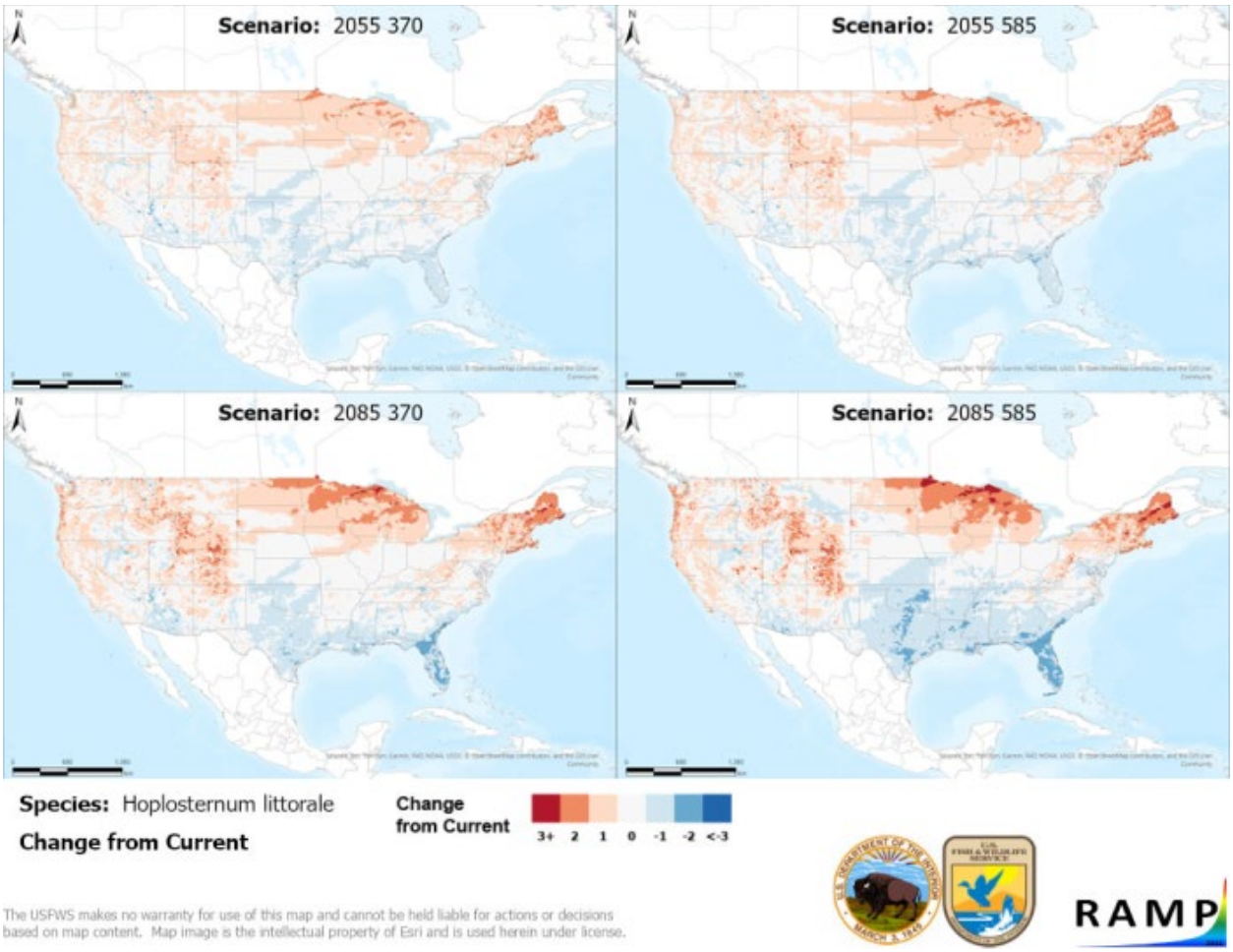


**Figure A3.** RAMP (Sanders et al. 2023) maps of the contiguous United States showing the difference between the current climate match target point score (figure 4) and the median target point score for future climate scenarios (figure A1) for *Hoplosternum littorale* based on source locations reported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

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