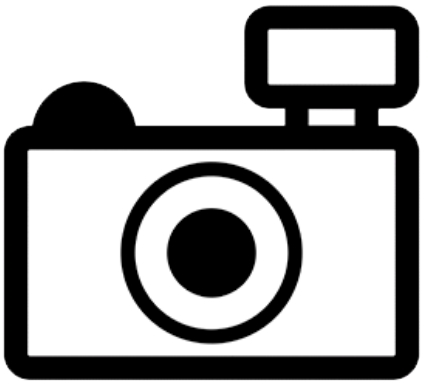
# Giant Trahira (*Hoplias lacerdae*)

## Ecological Risk Screening Summary

**U.S. Fish & Wildlife Service, August 2011**
**Revised, February 2017**
**Web Version, 1/16/2018**



No Photo Available

# 1 Native Range and Status in the United States

## Native Range

From Froese and Pauly (2016):

"South America: Ribeira de Iguape River basin in São Paulo and Paraná, Brazil."

From Oyakawa and Mattox (2009):

"[…] rio Uruguai […]"

The Uruguay River runs through southern Brazil and Uruguay.

## Status in the United States

This species has not been reported as introduced or established in the United States.

## Means of Introduction into the United States

This species has not been reported as introduced or established in the United States.

## Remarks

From Oyakawa and Mattox (2009):

"The *Hoplias lacerdae* group is defined as containing generally large trahiras with the medial margins of dentaries running parallel to each other and lacking teeth on the basihyal compared to the *H. malabaricus* group in which the medial margins of the dentaries converge towards the mandibular symphysis and which have teeth on the basihyal. A taxonomic revision of the group based on meristic and morphometric data identified five distinct species: *H. lacerdae* distributed in the rio Ribeira de Iguape and rio Uruguai; *H. intermedius* from the rio São Francisco, upper rio Paraná basin, and rio Doce; *H. brasiliensis* from rivers of the Atlantic Coastal drainage from the rio Paraguaçu to the rio Jequitinhonha; *H. australis* new species, endemic to the rio Uruguai; and *H. curupira* new species present in northern South America, including the rios Negro, Trombetas, Tapajós, Xingu, Tocantins and Capim in the Amazon basin, upper rio Orinoco near the rio Casiquiare (Venezuela), and coastal rivers of Guyana and Suriname."

# 2 Biology and Ecology

## Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthyes
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysi
Order Characiformes
Family Erythrinidae
Genus *Hoplias*
Species *Hoplias lacerdae* Miranda Ribeiro, 1908"

"Current Standing: valid"

## Size, Weight, and Age Range

From Froese and Pauly (2016):

"Max length : 75.0 cm SL male/unsexed; [Oyakawa 2003]; max. published weight: 4.3 kg [Zaniboni Filho et al. 2004]"

## Environment

From Froese and Pauly (2016):

"Freshwater; benthopelagic."

From Rosim et al. (2010):

"[…] *H. lacerdae* prefers lotic waters and more stable environmental conditions, being more sensitive to aquatic hypoxia (Godoy 1975)."

## Climate/Range

From Froese and Pauly (2016):

"Tropical, preferred ?"

## Distribution

### Native

From Froese and Pauly (2016):

"South America: Ribeira de Iguape River basin in São Paulo and Paraná, Brazil."

From Oyakawa and Mattox (2009):

"[…] rio Uruguai […]"

### Introduced

From Oyakawa and Mattox (2009):

"Malabarba (1989: 127) and Carlos Lucena (pers. comm.) mentioned that the species was introduced from rio Uruguay to rio Jacuí system in the 1980s."

From Pompeu and Alves (2003):

"Lagoa Santa is a shallow permanent lake, located in Belo Horizonte metropolitan region, Brazil. […] four non-native species [were] collected (*Hoplias lacerdae*, *Hoplosternum littorale*, *Cichla* cf. *monoculus* and *Tilapia rendalli*)."

From Silva et al. (2006):

"The present study aimed to describe the fish community structure from Juramento reservoir, located on Juramento River, a branch of [São Francisco River] basin. […] Only two non-native species, 'tamboatá' - *Hoplosternum littorale* (Hancock, 1828) and 'trairão' - *Hoplias lacerdae* Ribeiro, 1908 were found."

From Alves et al. (2007):

"Four non-native species (*Hoplias lacerdae*, *Lophiosilurus alexandri*, *Oreochromis niloticus*, *Prochilodus costatus*) make up the bulk of the current fishery [in the Rio Doce basin]."

From Rosim et al. (2010):

"[…] a portion of the Machado River into Furnas Hydroelectric Reservoir."

## Means of Introduction Outside the United States

From Rosim et al. (2010):

"[…] due to the aquaculture practices, currently it has been introduced in several hydrographic basins from Brazil."

From Alves et al. (2007):

"After 1974, construction of the Mascarenhas Hydropower plant limited the distribution of [native diadromous] species to the stretch below the dam, i.e., outside of Minas Gerais. This change in the river channel led to a less productive fishery above the dam […] As a result of the change in fish composition and reduction in size of the commercial fishery in this portion of the Rio Doce, non-native species were stocked to increase fish availability."

## Short Description

From Oyakawa and Mattox (2009):

"*Hoplias lacerdae* differs from the other species of *H. lacerdae* group in the number of pores of the laterosensory system along the ventral surface of dentary (6-8 vs. 4-6 in *H. brasiliensis* and *H. intermedius*, always 5 in *H. australis* and 4 in *H. curupira*). It can be further distinguished from *H. brasiliensis* and *H. curupira*, in the number of scales along lateral line (43-48 vs. 38-43 and 34-39 respectively)."

## Biology

From Froese and Pauly (2016):

"Piscivorous [Zaniboni Filho et al. 2004]."

From Oyakawa and Mattox (2009):

"In the rio Ribeira de Iguape, the species is regarded as rare by local fisherman and a two-year survey of its ichthyofauna failed to yield specimens of this species (Oyakawa et al., 2006). The small number of specimens of *Hoplias lacerdae* from rio Ribeira in ichthyological collections may be additional evidence that this species is uncommon, requiring further studies on its ecology and biology and special attention to its conservation status."

From Ferreira et al. (2016):

"*H. malabaricus* and *H. lacerdae* also spawn in nests and have parental care (Prado et al., 2006)."

## Human Uses

From Froese and Pauly (2016):

"Fisheries: commercial; aquaculture: commercial"

## Diseases

From Rosim et al. (2010):

"Studies about the parasitic fauna of *H. lacerdae* are scarce and few associations have been known for this host in wild environment. The recorded parasite species was *Contracaecum* sp., *Heterotyphlum* sp., *Hysterothylacium* sp., *Procamallanus* (*S.*) *inopinatus* Travassos 1929, *Procamallanus* (*S.*) *hilarii* Vaz & Pereira 1934 and *Dolops* sp. (Rodrigues et al. 1991, Moreira 1994, Brasil-Sato 2003, Thatcher 2006)."

"*Gamispatulus schizodontis* (Copepoda) was collected by the first time on two erythrinid fish species from Furnas Hydroelectric Reservoir, southeastern Brazil. The highest values of prevalence and abundance of the copepod were recorded on *Hoplias lacerdae*, an allochthonous species, introduced in this reservoir."

## Threat to Humans

From Froese and Pauly (2016):

"Harmless"

# 3 Impacts of Introductions

From Troca and Vieira (2012):

"In order to provide the public managers decisions about which species should be ecologically suitable for use in aquaculture in the coastal region of the Rio Grande do Sul State, this study classifies the invasive potential of several fish species used in inland aquaculture in the region. […] The protocol Fish Invasiveness Screening Kit - FISK was applied to classify non-native species according to invasive potential. […] *Hoplias lacerdae* presented medium invasive potential […] For the species with medium invasive potential further studies should be applied in order to determine the danger or not of its use in aquaculture in the region of Patos Lagoon."

From Pompeu and Alves (2003):

"The predatory pressure of two large-size piscivorous species (*Cichla* cf. *monoculus* and *Hoplias lacerdae*) may be related to the extinction of many small fish species, a dominant component of the original community in Lagoa Santa lake […]"

From Alves et al. (2007):

"The fish fauna of the central lake of Lagoa Santa was originally evaluated between 1850 and 1856 (Lütken, 2001). Approximately 70% of the original fish fauna was extirpated by 2002 (Pompeu and Alves, 2003). Although other environmental impacts affected the fish assemblage of Lagoa Santa, one cause of this drastic fish diversity loss was the introduction of four non-native species: a peacock bass (*Cichla* cf. *monoculus*), the trairão (*Hoplias lacerdae*), a tilapia (*Tilapia rendalli*), and a calichtid armored catfish—the hassar (*Hoplosternum littorale*). The first two species are piscivorous and attain larger sizes than other picivorous fishes originally present in the lake. The locally extinct species included two small native piscivorous species—the dog fish (*Acestrorhynchus lacustris*) and the white piranha (*Serrasalmus brandtii*)—and *Characidium lagosantense*, which is one of three officially endangered species in Minas Gerais freshwaters (Machado et al., 1998)."

"The most recent evaluation of endangered native species, to be ratified by the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA), includes four *Steindachneridion* species. Based on our observations of more than ten years, we believe that these species are almost extinct throughout their natural range in the basins of Rio Doce (*S. doceanum*) and Rio Paraíba do Sul (*S. parahybae*) due to environmental disturbances, including the introduction of other piscivores in the genera *Cichla*, *Clarias*, *Hoplias*, *Lophiosilurus*, *Pseudoplatystoma*, and *Salminus*."

# 4 Global Distribution

**Figure 1.** Known global established locations of *Hoplias lacerdae*. Map from GBIF (2016). Locations in Brazil outside the states of Bahia, Minas Gerais, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul were not included in climate matching because no information was available to confirm that they represent established populations.

# 5 Distribution within the United States

This species has not been reported as introduced or established in the United States.

# 6 Climate Matching

## Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was medium in the Southeast U.S., from New Jersey south and west to eastern Texas. The remainder of the contiguous U.S. showed a low climate match. Climate 6 proportion indicated that the contiguous U.S. has a high climate match overall. Proportions indicating a high climate match are those 0.103 and greater; Climate 6 proportion of *Hoplias lacerdae* was 0.120.

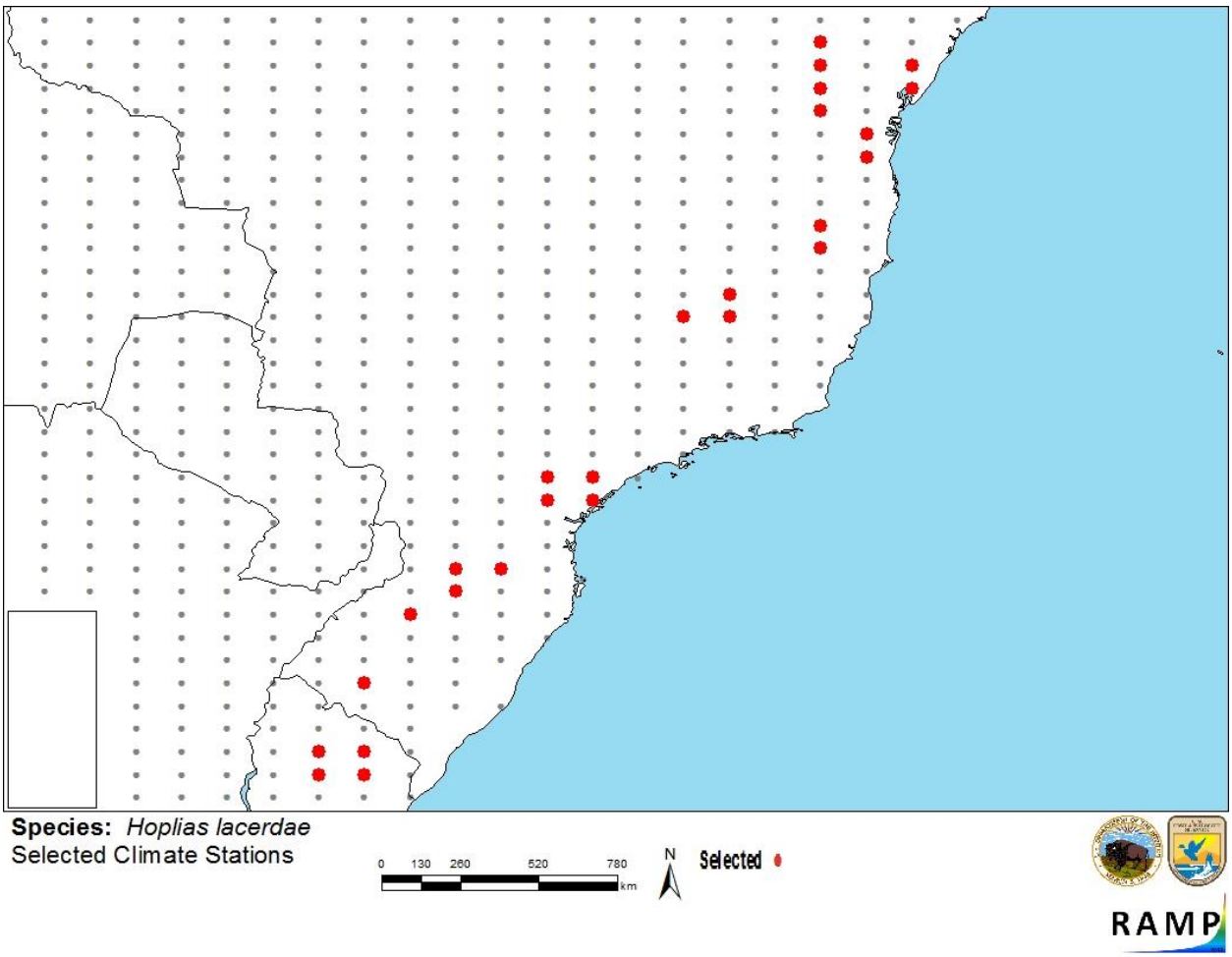



**Figure 2.** RAMP (Sanders et al. 2014) source map of southeastern Brazil and northern Uruguay showing weather stations selected as source locations (red) and non-source locations (gray) for *Hoplias lacerdae* climate matching. Source locations from Oyakawa and Mattox (2009) and GBIF (2016).

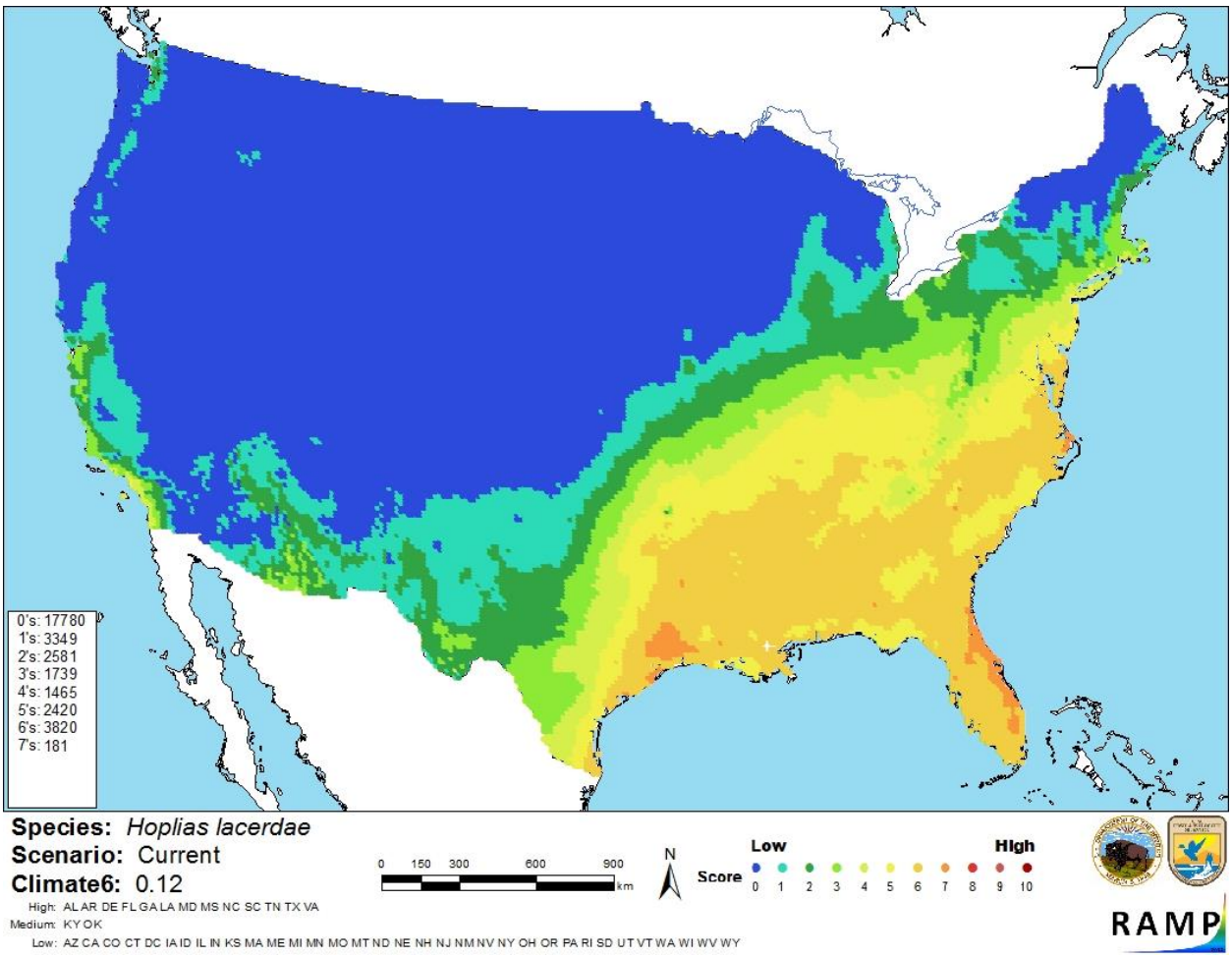



**Figure 3.** Map of RAMP (Sanders et al. 2014) climate matches for *Hoplias lacerdae* in the contiguous United States based on source locations reported by Oyakawa and Mattox (2009) and GBIF (2016). 0= Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

The "High", "Medium", and "Low" climate match categories are based on the following table:

| Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores) | Climate Match Category |
|---|---|
| 0.000≤X≤0.005 | Low |
| 0.005<X<0.103 | Medium |
| ≥0.103 | High |

# 7 Certainty of Assessment

Some information is available on the biology and ecology of *Hoplias lacerdae*. Its distribution, including locations of introduction, has not been clearly summarized in the literature. Multiple authors suggest impacts of introduction, but no clear and convincing evidence has been provided. Certainty of this assessment is low.

# 8 Risk Assessment

## Summary of Risk to the Contiguous United States

*Hoplias lacerdae* is an erythrinid fish species native to southeastern Brazil and Uruguay. It has been introduced to several other locations in Brazil for commercial fishing and aquaculture. *H. lacerdae* is suspected of being partially responsible for declines in some native fish species in locations where it has been introduced. However, no clear evidence has been documented that particularly implicates *H. lacerdae* as opposed to other introduced piscivores. Climate match to the contiguous U.S. is high, with the area of highest match occurring in the Southeast U.S. Overall risk posed by *H. lacerdae* is uncertain.

## Assessment Elements

- **History of Invasiveness: None Documented**
- **Climate Match: High**
- **Certainty of Assessment: Low**
- **Overall Risk Assessment Category: Uncertain**

# 9 References

**Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 10.**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# 10 References Quoted But Not Accessed

**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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