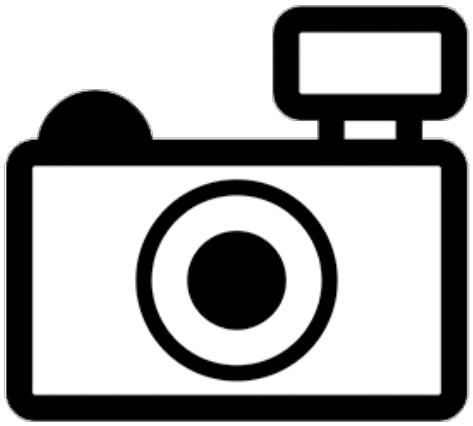
# *Potamotrygon signata* (a stingray, no common name)
## Ecological Risk Screening Summary

**U.S. Fish & Wildlife Service, August 2012**
**Revised, September 2018**
**Web Version, 3/10/2021**

Organism Type: Fish
Overall Risk Assessment Category: Uncertain




# 1 Native Range and Status in the United States

## Native Range

From Rosa et al. (2009):

"Inland waters of South America: apparently endemic to the Parnaíba river drainage in Northern Brazil (Rosa 1985)."

From Froese and Pauly (2018):

"South America: Parnaíba River basin."

## Status in the United States

No records of *Potamotrygon signata* in the wild or in trade in the United States were found.

The Florida Fish and Wildlife Conservation Commission has listed the freshwater stingray *Potamotrygon signata* as a conditional species. Conditional nonnative species (FFWCC 2020), "are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. These species are not allowed to be personally possessed, although exceptions are made by permit from the Executive Director for research, commercial use (with security measures to prevent escape or release) or public exhibition purposes."

From Arizona Office of the Secretary of State (2013):

"I. Fish listed below are considered restricted live wildlife: […]
32. All species of the family Potamotrygonidae. Common name: stingray."

From California Department of Fish and Wildlife (2019):

"It shall be unlawful to import, transport, or possess live animals restricted in subsection (c) below except under permit issued by the department. […]
Restricted species include: […]
Family Potamotrygonidae-River stingrays: All species (D)."

From Georgia DNR (2020):

"The exotic species listed below, except where otherwise noted, may not be held as pets in Georgia. This list is not all inclusive. […]
Fresh-water stingray; all species"

From Mississippi Secretary of State (2019):

"All species of the following animals and plants have been determined to be detrimental to the State's native resources and further sales or distribution are prohibited in Mississippi. No person shall import, sell, possess, transport, release or cause to be released into the waters of the state any of the following aquatic species or hybrids thereof. However, species listed as prohibited may be allowed under a permitting process where environmental impact has been assessed. […]
Freshwater stingrays Family Potamotrygonidae **** [indicating all species within the family are included in the regulation]"

From State of Nevada (2018):

"Except as otherwise provided in this section and NAC 504.486, the importation, transportation or possession of the following species of live wildlife or hybrids thereof, including viable embryos or gametes, is prohibited: […]
Freshwater stingray.....All species in the family Potamotrygonidae"

From Oklahoma Secretary of State (2019):

"Until such time as is necessary for the Department of Wildlife Conservation to obtain adequate information for the determination of other harmful or potentially harmful exotic species, the

importation into the State and/or the possession of the following exotic fish or their eggs is prohibited: […]
Freshwater Stingray group: *Paratrygon* spp., *Potomotrygon* spp., and *Disceus* spp."

From Texas Parks and Wildlife (2020):

"The organisms listed here are legally classified as exotic, harmful, or potentially harmful. No person may possess or place them into water of this state except as authorized by the department. Permits are required for any individual to possess, sell, import, export, transport or propagate listed species for zoological or research purposes; for aquaculture (allowed only for Blue, Nile, or Mozambique tilapia, Triploid Grass Carp, or Pacific White Shrimp); or for aquatic weed control (for example, Triploid Grass Carp in private ponds). […]
Freshwater Stingrays, Family Potamotrygonidae All species"

## Means of Introductions in the United States

No records of *Potamotrygon signata* in the wild in the United States were found.

## Remarks

From Rosa et al. (2009):

"This species could be misidentified as *P. scobina* (Almeida, pers. obs.) and *P. castexi* (Rosa 1985), which have similar colour patterns."

# 2 Biology and Ecology

## Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2018), *Potamotrygon signata* Garman 1913 is the valid name for this species; it is also the original name.

From ITIS (2021):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Chondrichthyes
Class Chondrichthyes
Subclass Elasmobranchii
Superorder Euselachii
Order Myliobatiformes
Family Potamotrygonidae
Genus *Potamotrygon*
Species *Potamotrygon signata* Garman 1913

## Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 30.0 cm WD male/unsexed; [Carvalho, et al. 2003]"

## Environment

From Froese and Pauly (2018):

"Freshwater; benthopelagic."

## Climate

From Froese and Pauly (2018):

"Tropical"

## Distribution Outside the United States

### Native

From Rosa et al. (2009):

"Inland waters of South America: apparently endemic to the Parnaíba river drainage in Northern Brazil (Rosa 1985)."

From Froese and Pauly (2018):

"South America: Parnaíba River basin."

### Introduced

No records of introductions of *Potamotrygon signata* outside their native range were found.

## Means of Introduction Outside the United States

No records of introductions of *Potamotrygon signata* outside their native range were found.

## Short Description

From Ramos (2017):

"According to Rosa (1985) it presents an oval disc with the dorsal surface olivaceousbrown, darker on midline, mottled with small, oval or irregular yellow spots, which occasionally form labyrinthic network. Spots decrease in size towards disc margins, but the largest spots are smaller than eye in diameter. The tail presents dorsal yellow vermiculations."

From Moro and de Souza Rosa (2016):

"Tooth crowns are flattened in both sexes, polygonal shaped in apical view in females and juvenile males, and conical with a pointed central cusp in mature males […]."

## Biology

From Moro and de Souza Rosa (2016):

"They generally feed on invertebrates (insects, mollusks, crustaceans and annelids) and fishes (Rosa et al. 2010)."

From Rosa et al. (2009):

"This species probably migrates downstream along the Poty River (a tributary of the Parnaíba River) during the rainy season, and returns to the upper course in the dry period. Aside from this speculation, life history aspects of this freshwater stingray are completely unknown. It is certainly among the least known potamotrygonids and might present different biological and ecological characteristics since it is apparently more isolated than other species, occurring in a single river basin away from the Amazon and Paraguay-Paraná basins."

## Human Uses

From Moro and de Souza Rosa (2016):

"In the Parnaíba river basin, the capture of stingrays is normally accidental, and there is not a fishery directed to *P. signata*. This species is captured as by-catch in several fishing modalities such as fishing rod, hand lines, gillnets and cast nets […]. After capture, these animals are either consumed as food or discarded, live or dead."

"In spite of the mention of the use of *P. signata* in the ornamental fish trade by Araujo et al. (2004), no direct fishery for this purpose was observed in our study."

"The liver oil, called "banha de arraia" […], was pointed out as having therapeutic properties, particularly for the treatment of respiratory illnesses."

"The stings removed from stingrays are sun-dried and sold in local markets for the price of R$10.00-R$15.00 (about US$3.00) per unit. Larger stings may reach a price of R$20.00. The major consumers of the stings are Indians, who use them as arrow heads, and people who attend magical/religious rituals. In the municipality of Uruçuí/PI, the use of stings as torture instruments by enforcers of the law was cited by local people. Finally, the use of stings sticking out of a board as an obstacle in cattle gate passages was mentioned in the rural area of Sambito river in Piauí (R.S. Rosa pers. obs.)."

## Diseases

**No records of OIE-reportable diseases (OIE 2021) were found for *Potamotrygon signata* were found.**

According to Poelen et al. (2014), *P. signata* is a potential host of *Rhinebothroides glandularis*.

### Threat to Humans

From Moro and de Souza Rosa (2016):

"Information obtained in a local public health facility revealed that injured people [injuries from stingray stings] who do not seek immediate medical assistance may face severe complications, such as necrosis and amputation. When associated to other health conditions, such as diabetes, death of the patient may occur."

# 3 Impacts of Introductions

No records of introductions of *Potamotrygon signata* were found, therefore there is no information on impacts of introductions to evaluate.

This species is regulated in multiple States, see section 1.

# 4 History of Invasiveness

No records of introduction were found for *Potamotrygon signata*. History of invasiveness of *Potamotrygon signata* is classified as No Known Nonnative Population.

# 5 Global Distribution

**Figure 1**. Known global distribution of *Potamotrygon signata.* Locations are in Peru and Brazil. Map from GBIF Secretariat (2018). The most western observation, in Peru, was determined not to represent an established population because it is outside the described range of the species, and no introduced populations have been reported. That point was not used to select source points in the climate match.

# 6 Distribution Within the United States

There are no records of *Potamotrygon signata* in the United States.

# 7 Climate Matching

## Summary of Climate Matching Analysis

The climate match for *Potamotrygon signata* was low throughout the entire contiguous United States. There were no areas of medium or high match. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for contiguous United States was 0.000, low (scores between 0.000 and 0.005, inclusive, are classified as low). All states had low individual climate scores.

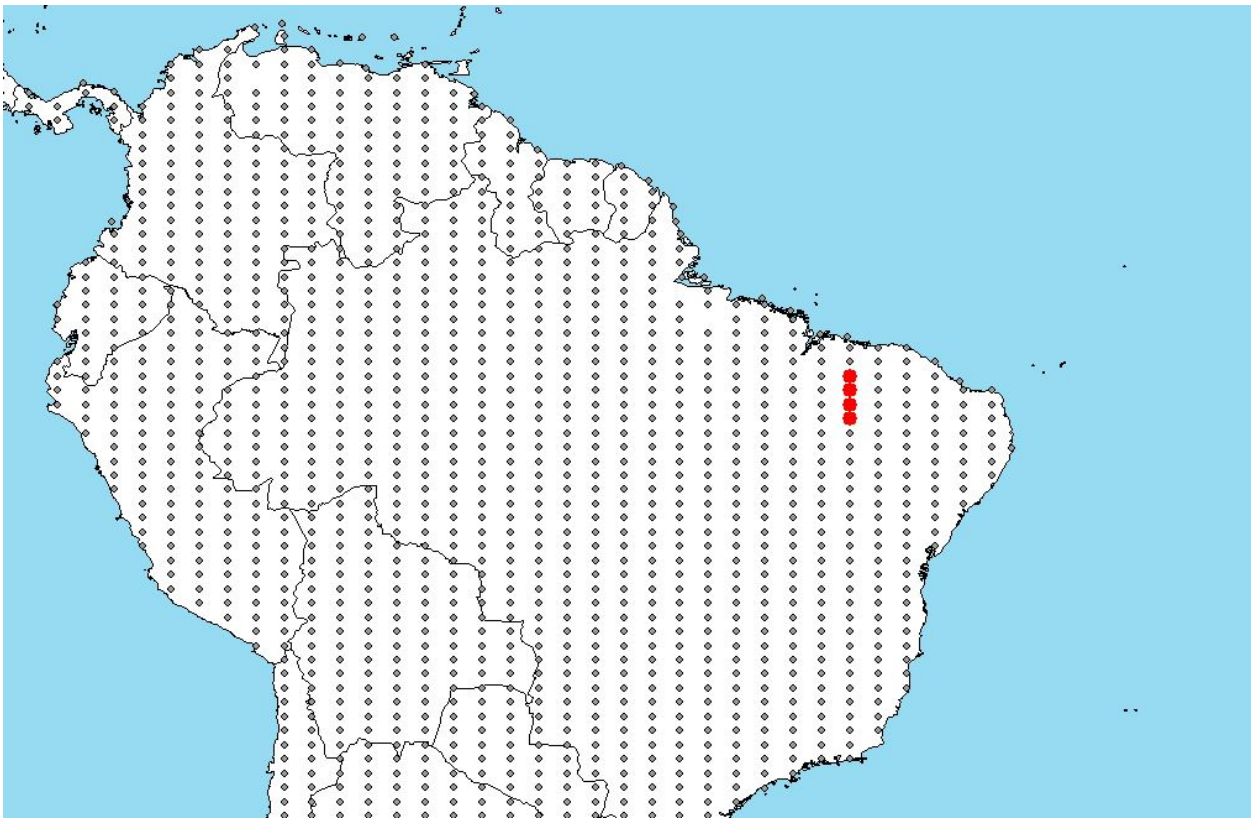


**Figure 2**. RAMP (Sanders et al. 2018) source map showing South America with weather stations in Brazil selected as source locations (red) and non-source locations (gray) for *Potamtrygon signata* climate matching. Source locations from GBIF Secretariat (2018). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

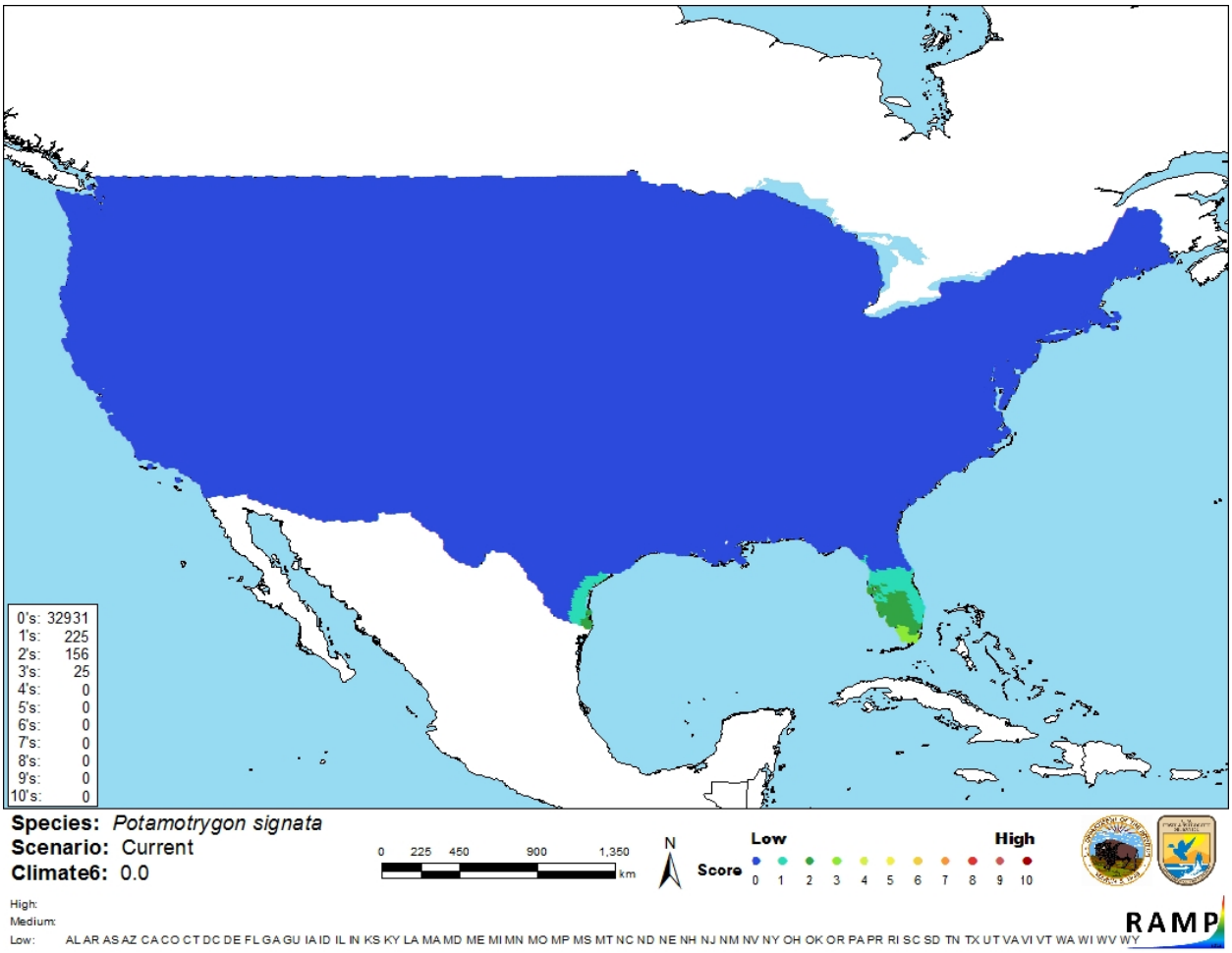



**Figure 3**. Map of RAMP (Sanders et al. 2018) climate matches for *Potamtrygon signata* in the contiguous United States based on source locations reported by GIBF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

| Climate 6:<br>(Count of target points with climate scores 6-10)/<br>(Count of all target points) | Overall<br>Climate Match<br>Category |
|---|---|
| 0.000≤X≤0.005 | Low |
| 0.005<X<0.103 | Medium |
| ≥0.103 | High |

# 8 Certainty of Assessment

The certainty of assessment is low. There was little general information about the species available from peer-reviewed sources. There were no records of introductions found, and therefore there is no information no impacts available to evaluate.

# 9 Risk Assessment

## Summary of Risk to the Contiguous United States

*Potamotrygon signata* is a freshwater stingray endemic to the Parnaíba River basin in northern Brazil. There is no fishery directed towards *P. signata* and no indication that they are in trade. There is some by-catch from fishing, and some of these individuals may be consumed. Injuries to humans from stingray stings are possible, leading to some of the by-caught individuals being killed. This species is regulated in multiple States. There have been no reports of introductions. History of invasiveness is classified as No Known Nonnative Population. The climate match with the contiguous United States is low, with no areas of medium or high match. Limited information is currently known about *P. signata* causing the certainty of this assessment to be low. The overall risk assessment category for *Potamotrygon signata* is Uncertain.

## Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): Low**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information: No additional remarks**
- **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.**


Arizona Office of the Secretary of State. 2013. Live wildlife. Arizona Administrative Code, Game and Fish Commission, Title 12, Chapter 4, Article 4.

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[OIE] World Organisation for Animal Health. 2021. OIE-listed diseases, infections and infestations in force in 2021. Available: http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2021/ (March 2021).

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Poelen JH, Simons JD, Mungall CJ. 2014. Global Biotic Interactions: an open infrastructure to share and analyze species-interaction datasets. Ecological Informatics 24:148-159.

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Sanders S, Castiglione C, Hoff M. 2018. Risk Assessment Mapping Program: RAMP. Version 3.1. U.S. Fish and Wildlife Service.

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Texas Parks and Wildlife. 2020. Invasive, prohibited and exotic species. Austin: Texas Parks and Wildlife. Available: https://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml (November 2020).

# 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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Carvalho MR de, Lovejoy N, Rosa RS. 2003. Potamotrygonidae (river stingrays). Pages 22–28 in Reis RE, Kullander SO, Ferraris CJ Jr, editors. Checklist of the freshwater fishes of South and Central America. Porto Alegre, Brazil: EDIPUCRS.

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