

***Potamotrygon tigrina* (a stingray, no common name)**

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, August 2012
Revised, October 2018
Web Version, 1/20/2021

Organism Type: Fish

Overall Risk Assessment Category: Uncertain



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1 Native Range and Status in the United States

Native Range

From Carvalho et al. (2011):

“The holotype [*Potamotrygon tigrina*] is from Río Nanay, a moderate blackwater tributary of Río Amazonas, at Pampa Chica, near Iquitos, Peru [...]. Pampa Chica is a large beach of fine sand along the left bank of a hairpin curve in river, approximately 11 river km upstream from the confluence with Río Amazonas [...]. We suspect, however, that *P. tigrina* is slightly more

widespread in the upper Río Amazonas (according to one aquarium importer, it also occurs in the Río Putumayo as well, but this is not confirmed).”

From Froese and Pauly (2018):

“South America: Río Nanay, upper Amazon basin in Peru.”

Status in the United States

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

From Reynolds et al. (2017):

“Trade and transport of potamotrygonids [neotropical river stingrays] is currently regulated and/or prohibited in the following states and territories: Arizona, California, Florida, Georgia, Oklahoma, Puerto Rico, Nevada, Texas and Utah. Zoos and public aquaria may be granted special permission to transport and hold potamotrygonids.”

“*P. tigrina* has been successfully maintained at several AZA [Association of Zoos and Aquariums] institutions, with reproduction achieved at the Vancouver Aquarium [British Columbia, Canada] and John G. Shedd Aquarium [Chicago, Illinois].”

Potamotrygon tigrina is considered a prohibited species in Mississippi (Mississippi Secretary of State 2019). Prohibited species “have been determined to be detrimental to the State's native resources and further sales or distribution are prohibited in Mississippi.”

Means of Introductions in the United States

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

Remarks

From Carvalho et al. (2011):

“*Potamotrygon tigrina* has been misidentified as *Potamotrygon menchacai* Achenbach, 1967 in the aquarium literature (e.g. Ross & Schäfer, 2000; numerous websites), even though *P. menchacai* was described from Río Colastiné, a tributary of Río Paraná, near Santa Fe, Argentina.”

According to Reynolds et al. (2017), the AZA Freshwater Fish Taxon Advisory Group has designated *P. tigrina* as one of four stingray species as a priority for breeding.

García et al. (2016):

“Red List Category & Criteria: Endangered.”

“This species is so far known only from a few locations (two to five) and has a restricted distribution (extent of occurrence (EOO) = 1,500 km²). Considering its low fertility rate and the

high value that it reaches in the ornamental market, which increases its capture pressure, a continuous decline in the number of mature individuals is inferred. Therefore, it is listed as Endangered.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2018), *Potamotrygon tigrina* (Carvalho, Sabaj Pérez, and Lovejoy, 2011) is the current valid name for this species.

From ITIS (2018):

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 tigrina* (Carvalho, Sabaj Pérez, and Lovejoy, 2011)”

Size, Weight, and Age Range

From Carvalho et al. (2011):

“Allegedly, it [*Potamotrygon tigrina*] is capable of reaching sizes of up to 1 m in disc width (which would make it one of the largest species of *Potamotrygon*).”

Carvalho et al. (2011) lists the total length of a juvenile male as 495.0 mm, and the total length of a preadult female as 560.0 mm for *Potamotrygon tigrina*.

From Reynolds et al. (2017):

“Experience has shown that female *P. tigrina* become sexually mature at ~48 cm DW [disc width] in aquaria. Although a maximum size has not been confirmed, *P. tigrina* has reached at least 70 cm DW in aquaria; [...].”

From Dell’Amore (2011):

“Up to 31 inches (80 centimeters) wide.”

Environment

From Froese and Pauly (2018):

“Freshwater; benthopelagic.”

From Reynolds et al. (2017):

“Water parameter ranges [...] were: a pH of 6.6 - 8.0, a water temperature of 25.0 - 28.5°C, and a nitrate concentration of 0 - 20 mg/L NO₃-N. [...] *P. tigrina* were maintained on fine sand in water with low mineral content, [...]”

“*P. tigrina* may be distressed when maintained in aquaria without fine sand and without darkened areas for refuge.”

Climate

From Froese and Pauly (2018):

“Tropical”

Distribution Outside the United States

Native

From Carvalho et al. (2011):

“The holotype is from Río Nanay, a moderate blackwater tributary of Río Amazonas, at Pampa Chica, near Iquitos, Peru [...]. Pampa Chica is a large beach of fine sand along the left bank of a hairpin curve in river, approximately 11 river km upstream from the confluence with Río Amazonas [...] We suspect, however, that *P. tigrina* is slightly more widespread in the upper Río Amazonas (according to one aquarium importer, it also occurs in the Río Putumayo as well, but this is not confirmed).”

From Froese and Pauly (2018):

“South America: Río Nanay, upper Amazon basin in Peru.”

Introduced

No records of *Potamotrygon tigrina* introductions in the wild were found.

Means of Introduction Outside the United States

No records of *Potamotrygon tigrina* introductions in the wild were found.

Short Description

From Carvalho et al. (2011):

“A species of *Potamotrygon* diagnosed by its unique dorsal color pattern, composed of a light to dark brown or blackish background color, with a tan, bright yellow or orange irregular, highly curved and convoluted vermiculate pattern over entire disc and base of tail region, extending posteriorly to about one-half of tail length (to close to level of caudal stings). *Potamotrygon tigrina*, n. sp., is further distinguished from all other species of *Potamotrygon*, except *P. schroederi*, by presenting the distal half of tail, from about caudal sting origin, with a sharply contrasted pattern of five to six solid dark brown to black bars and uniformly cream colored interspaces of more or less equal width.”

“Disc longer than wide, relatively oval, and widest at more or less midlength.”

“Eyes relatively small, but clearly protruding from top of head region; eyes smaller than spiracles in diameter. Spiracles closely adjacent to eyes, rhomboidal in shape and very large in live specimens, slit-like in preserved holotype.”

“Mouth relatively small, its opening somewhat straight across. Mouth width about one-half distance between first gill slits, and slightly greater than internarial distance.”

“Dorsal surface of disc, in alcohol preserved holotype, with dark to light brown background color, becoming slightly lighter close to disc margin. Tan, yellow to orange irregular vermiculated pattern over entire disc and base of tail posteriorly to about one-half of tail length, close to level of caudal stings.”

“In live specimens, overlying color tannish bronze to golden yellow or even orange, with very dark brown to blackish background color; vermiculate pattern isolating dark brown to black spots of background color. Variation in vermiculations great, ranging from very tight, minute vermicular markings to more broad patterns highlighting greater background areas that range from circular to more elongate streaks. Black bars on distal half of tail more strongly contrasted with pale white to yellowish interspaces. Live newborn pups with more faded dorsal color, but vermiculate markings usually light orange.”

Biology

From Garcia et al. (2016):

“Even though according to Carvalho et al. (2011) the species may be present in the Upper Amazon River basin, very little is known about its population.”

From Carvalho et al. (2011):

“Much work on its [*P. tigrina*] basic biology, including its reproductive parameters and population dynamics, is needed in order to properly evaluate if conservation measures should be enacted.”

From Dell'Amore (2011):

“Overall there’s virtually nothing known about the tiger ray-in fact, aquarium traders who catch them in the wild or breed them in captivity probably know much more about their biology than most scientists.”

Human Uses

From Carvalho et al. (2011):

“*Potamotrygon tigrina* has been imported by commercial ornamental fish dealers for at least 13 years, and is considered a difficult species to keep in captivity [Ross & Schäfer, 2000].”

From Dell'Amore (2011):

“*P. tigrina* is one of the most popular types of pet rays in Asia, especially in Japan and China.”

Diseases

No information on diseases of *Potamotrygon tigrina* was found. **No records of OIE-reportable diseases (OIE 2021) were found for *P. tigrina*.**

Threat to Humans

From Reynolds et al. (2017):

“Envenomation [process by which venom is injected by the stinger] by a potamotrygonid [includes *P. tigrina*] may result in severe injury, typically exceeding the degree of trauma resulting from the barb of a marine stingray. [...] Potamotrygonid envenomation may result not only in severe pain, but also edema, erythema, tissue necrosis, and ulcers, which can take up to three months to heal [Haddad et al., 2004].”

3 Impacts of Introductions

No records of *Potamotrygon tigrina* introductions in the wild were found, therefore, there is no information on impacts of introductions.

4 History of Invasiveness

No records of introductions of *Potamotrygon tigrina* were found, therefore the history of invasiveness is classified as “no known nonnative populations.”

5 Global Distribution



Figure 1. Known global distribution of *Potamotrygon tigrina*. Location is in Peru. Map from VertNet (2018).

6 Distribution Within the United States

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

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Potamotrygon tigrina* was low for the entire contiguous United States. There were no areas of high or medium 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.

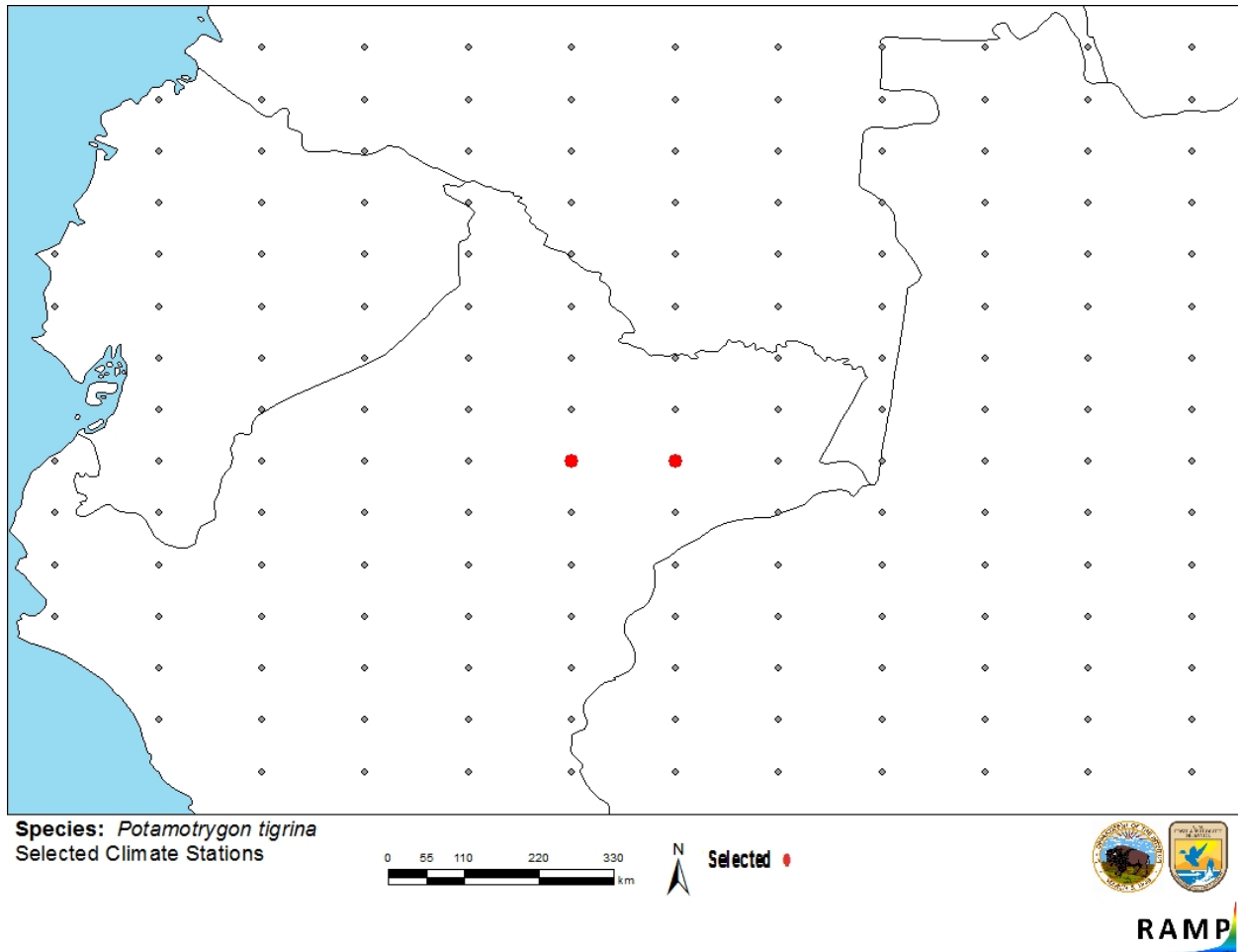


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in South America selected as source locations (red; Peru) and non-source locations (gray) for *Potamotrygon tigrina* climate matching. Source locations from Vert Net (2018). Selected source locations are within 100 km of one or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

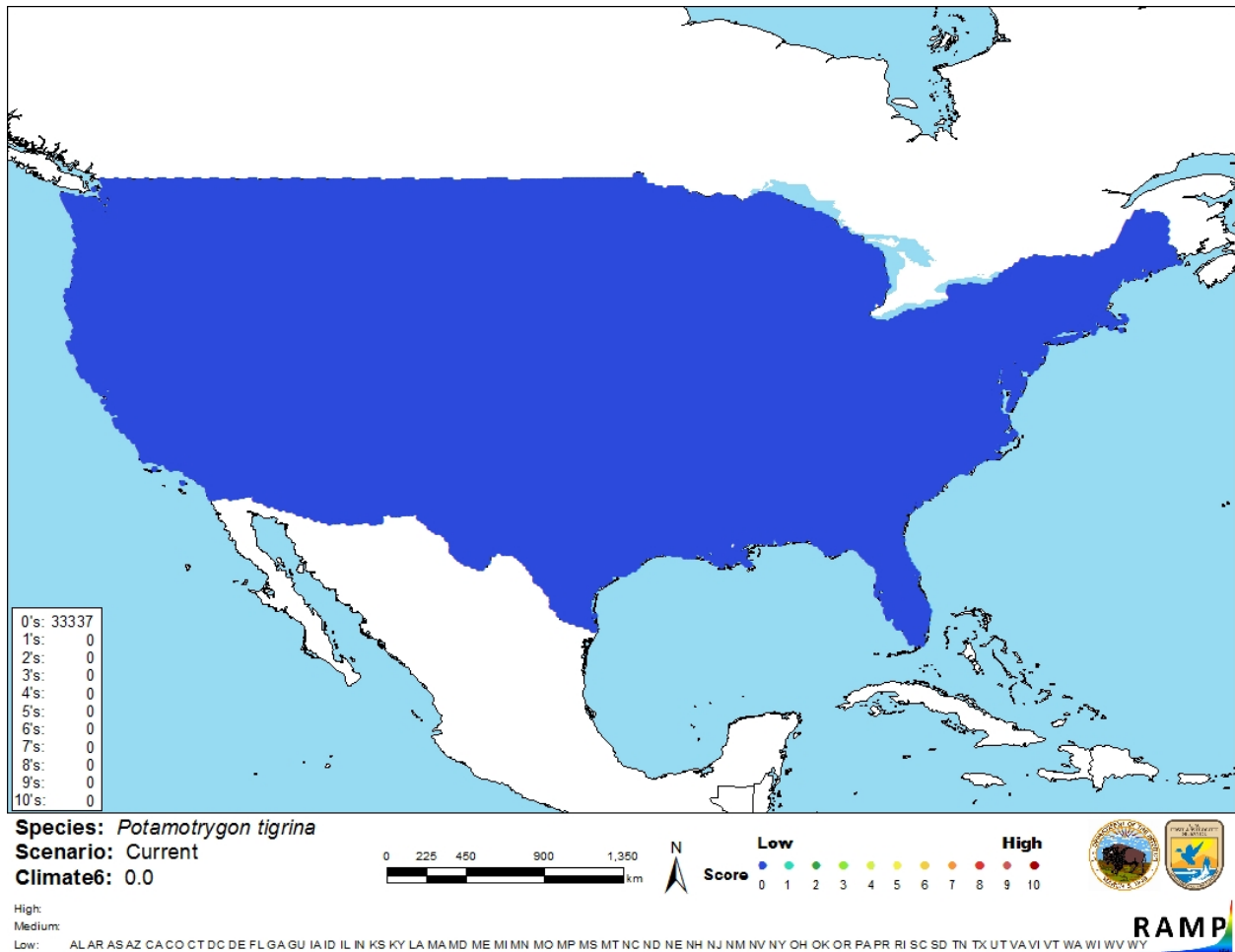


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Potamotrygon tigrina* in the contiguous United States based on source locations reported by Vert Net (2018). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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

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

8 Certainty of Assessment

The certainty of assessment for *Potamotrygon tigrina* is low. There is detailed information about the physical description (morphometrics and meristics) of this species, but little information appears to be available pertaining to species life history and ecology. Some information about *P. tigrina* has been determined through development of husbandry techniques for public aquaria

and commercial breeding. No records of established populations or impacts of introduction outside of Peru were found.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Potamotrygon tigrina is a freshwater stingray found in the upper Amazon basin in Peru. The history of invasiveness is classified as “no known nonnative population.” Freshwater stingrays from South America have become increasingly popular for display in public aquaria in the United States and Canada. *P. tigrina* is a popular pet in Asia. *P. tigrina* has been transported beyond its native range due to commercial trade for at least 13 years with no found evidence of establishment in the wild outside of its native range. However, there is no information on the volume of this species in trade which precludes listing the history of invasiveness as low. This species is regulated in some States. The climate match was low. There were no areas of high or medium match in the contiguous United States. The certainty of assessment is low. The overall risk assessment category 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 information**
- **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.

Carvalho MRD, Sabaj Perez MH, Lovejoy NR. 2011. *Potamotrygon tigrina*, a new species of freshwater stingray from the upper Amazon basin, closely related to *Potamotrygon schroederi* Fernandez-Yépez, 1958 (Chondrichthyes: Potamotrygonidae). *Zootaxa* 2827:1–30.

Dell’Amore C. 2011. New species of tiger stingray named. *National Geographic News*. Washington, D.C. Available: <https://news.nationalgeographic.com/news/2011/05/110506-new-tiger-stingray-amazon-pet-fish-animals-science/> (August 2012).

Fricke R, Eschmeyer WN, van der Laan R, editors. 2018. *Catalog of fishes: genera, species, references*. California Academy of Science. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp> (September 2018).

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Mississippi Secretary of State. 2019. Guidelines for aquaculture activities. Mississippi Administrative Code, Title 2, Part 1, Subpart 4, Chapter 11. Jackson, Mississippi: Regulatory and Enforcement Division, Office of the Mississippi Secretary of State.

Reynolds J, Hornbrook E, Stettner G, Terrell R. 2017. Husbandry of freshwater stingrays. Pages 99–112 in Smith M, Warmolts D, Thoney D, Hueter R, Murray M, Ezcurra J, editors. Elasmobranch husbandry manual II: recent advances in the care of sharks, rays and their relative. Columbus, Ohio: Ohio Biological Survey. Special Publication.

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

VertNet. 2018. VertNet. Available: <http://www.vertnet.org/index.html> (September 2018).

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.

Haddad Jr V, Garrone Neto D, de Paula Neto JB, Marques FPL, Barbaro KC. 2004. Freshwater stingrays: study of epidemiologic, clinic and therapeutic aspects based on 84 envenomings in humans and some enzymatic activities of the venom. *Toxicon* 43:287–294.

Smith MFL, Marshall A, Correia JP, Rupp J. 2004. Elasmobranch transport techniques and equipment. Pages 105–131 in Smith M, Warmolts D, Thoney D, Hueter R, editors. The elasmobranch husbandry manual: captive care of sharks, rays, and their relatives. Columbus, Ohio: Ohio Biological Survey. Special Publication.

Ross RA, Schäfer F. 2000. Aqualog Süßwasser Rochen: freshwater rays. Verlag ACS, Mörfelden-Walldorf.