Magdalena River Stingray (*Potamotrygon magdalenae*)
Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, August 2012
Revised, September 2018
Web Version, 3/2/2021

Organism Type: Fish
Overall Risk Assessment Category: Uncertain

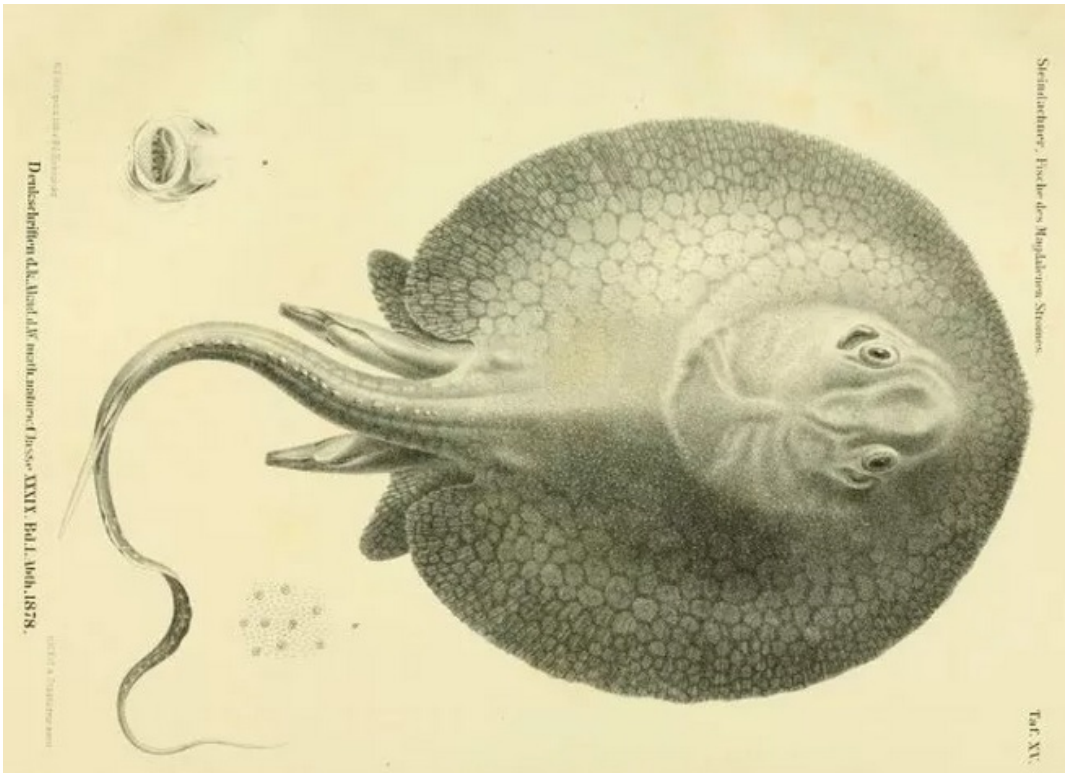

Image: A. H. A. Dumeril. Public domain. Available: https://commons.wikimedia.org/wiki/File:Potamotrygon_magdalenae.jpg. (September 6, 2018).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"[In Colombia:] Known from the Magdalena, Cauca, San Jorge, and Atrato river basins. Apparently absent in the Sinú river basin. Ascends river tributaries such as Tibu, the Sardinata,

and the Zulia. Type locality: Río Magdalena, Colombia [Eschmeyer 1998]. Found in San Cristóbal and La Dorada [Thorson et al. 1988]."

Status in the United States

No records of *Potamotrygon magdalenae* 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 magdalenae* as a conditional species. Conditional nonnative species (FFWCC 2018), "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 magdalenae* in the wild in the United States were found.

Remarks

From Lasso et al. (2016):

"This species has been mistaken for *P. yepezi* from Lake Maracaibo (Rosa 1985). It is also pointed out as being easily mistaken for *P. falkneri*, *P. signata* and *P. castexi* in the ornamental trade (Ross and Schäfer 2000)."

"It is included in the National Action Plan for the conservation and management of sharks, rays and quimaeras of Colombia (Caldas et al. 2010) as a species of very high action priority, in relation to its fishing, trade and distribution. Base-line studies are required to acquire more information regarding the life history aspects of this species."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2018), *Potamotrygon magdalenae* (Duméril 1865) is the valid name for this species. It was originally described as *Taeniura magdalenae*.

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 magdalenae* (Duméril, 1865)

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 35.0 cm WD male/unsexed; [de Carvalho et al. 2003]; max. published weight: 755.10 g [Hernández-Serna et al. 2014]"

Environment

From Froese and Pauly (2018):

"Freshwater; benthopelagic."

Climate

From Froese and Pauly (2018):

"Tropical"

Distribution Outside the United States

Native

From Froese and Pauly (2018):

"[In Colombia:] Known from the Magdalena, Cauca, San Jorge, and Atrato river basins. Apparently absent in the Sinú river basin. Ascends river tributaries such as Tibu, the Sardinata, and the Zulia. Type locality: Río Magdalena, Colombia [Eschmeyer 1998]. Found in San Cristóbal and La Dorada [Thorson et al. 1988]."

Introduced

No records of *Potamotrygon magdalenae* introductions were found.

Means of Introduction Outside the United States

No records of *Potamotrygon magdalenae* introductions were found.

Short Description

From Carvalho et al. (2011):

"*Potamotrygon magdalenae* (Valenciennes, 1865), a very small species from the Magdalena and Atrato basins in Colombia, also has numerous small spots on dorsal surface, but these may form vermiculate markings that are, however, much finer than in *P. tigrina* […]; *P. magdalenae* also has a lighter brown to olive background color and lacks wide alternating vertical stripes on tail […]."

Biology

From Lasso et al. (2016):

"This species inhabits both headwaters and lower drainages of some rivers within its distribution range (Galvis et al. 1997), and both in the main riverbed and floodplain lakes (Mójica et al. 2012). It occurs in turbid waters, with sandy and muddy substrates, murky and shallow, slow-current waters (Dahl 1971, Galvis et al. 1997, Mójica et al. 2012)."

"Most reproductive biology information available comes from a single research study carried out by Teshima and Takeshita (1992). It is a viviparous aplacental species that develops only one embryo in each uterus (Teshima and Takeshita 1992). Its observed fecundity varied between 1 and 3 embryos (Mójica et al. 2012). Ramos-Socha (2010) pointed out a larger proportion of mature females between January and March, with a peak in March and a decline around May. The female gestation takes place afterwards in November and in April and May (Mójica et al. 2012). Dahl (1971), in a general study of the fish in Northern Colombia, mentioned that this species reached maturity with less than 25 cm of disc width. The information available suggests that this species reaches sexual maturity at a small disc width size and presents a low fecundity. Since most potamotrygonids present a defined reproductive period (Charvet-Almeida et al. 2005), it is possible that Teshima and Takeshita (1992) could not observe this due to the short length of their sampling period."

"It feeds on detritus (dead organic matter) and larvae (Galvis et al. 1997), occasionally aquatic invertebrates and insects (Villa-Navarro 1999), larvae and adults of the family Polymitarcidae (Ramos-Socha 2010), fish, crabs, tadpoles, snails, insects and organic matter (Dahl 1971, Lasso et al. 2011, Mójica et al. 2012)."

Human Uses

From Lasso et al. (2016):

"In the Magdalena basin, the young are captured for ornamental purposes and due to the collapse of fisheries of other species, adults of the Magdalena Stingray are captured for subsistence (Lasso et al. 2011, Mójica et al. 2012)."

"In 2004, this species was entering the ornamental trade (Gonella 1997, Ross and Schäfer 2000) without any specific regulation and monitoring. No information was available about how many specimens were exported and to what extent this might represent a threat for the species. It is currently the most exported ornamental fish and it is estimated that 60-70% of the exported rays [from Colombia] belong to this species (Perdomo-Núñez 2005). According to INCODER (Instituto Colombiano de Desarrollo Rural), 14,621 individuals, captured from Ciénaga Grande de Santa Marta, dam del Gúajaro, small swamps or lagoons near the airport of Barranquilla and the Prado dam (Tolima), were exported in 2009 (Mójica et al. 2012)."

"Informal reports indicate that this species is also caught as by-catch in fisheries that target some bony fish of economic value in the river basins where *P. magdalenae* is found."

Diseases

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

Potamotrygon magdalenae is listed as a host of *Potamotrygonocestus magdalenensis* (Brooks and Thorson 1976; Brooks and Amato 1992), *Rhinebothrium moralarai* (Brooks and Thorson 1976), *Paravitellotrema overstreeti* (Brooks and Amato 1992), *Acanthobothrium quinonesi* (Brooks and Amato 1992), *Rhinebothroides moralarai* (Brooks and Amato 1992), *Rhinebothrium paratrygoni* (Poelen et al. 2014), *Potamotrygonocotyle eurypotamoxenus* (Poelen et al. 2014), and *Genarchella overstreeti* (Poelen et al. 2014).

Threat to Humans

From Lasso et al. (2016):

"Many individuals by-caught in the Atrato basin are killed because of fear of injuries from the stinger (Perdomo-Núñez 2005, Mójica et al. 2012)."

3 Impacts of Introductions

No records of *Potamotrygon magdalenae* introductions were found. Therefore, there is no information on impacts of introductions.

Potamotrygon magdalenae is regulated in multiple States.

4 History of Invasiveness

No records of *Potamotrygon magdalenae* introductions were found. The history of invasiveness is classified as No Known Nonnative Population.

5 Global Distribution

Figure 1. Known global distribution of *Potamotrygon magdalenae*. Locations are in northern Colombia. Map from GBIF Secretariat (2018).

6 Distribution Within the United States

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

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Potamotrygon magdalenae* is low for most of the contiguous United States. Southern Florida had a medium match and there were additional small areas of medium match in southern Texas, the California coast, and the Pacific Northwest. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for contiguous United States was 0.001, low (scores between 0.000 and 0.005, inclusive, are classified as low). All States had low individual climate scores, except for Florida, which had a medium individual climate score.

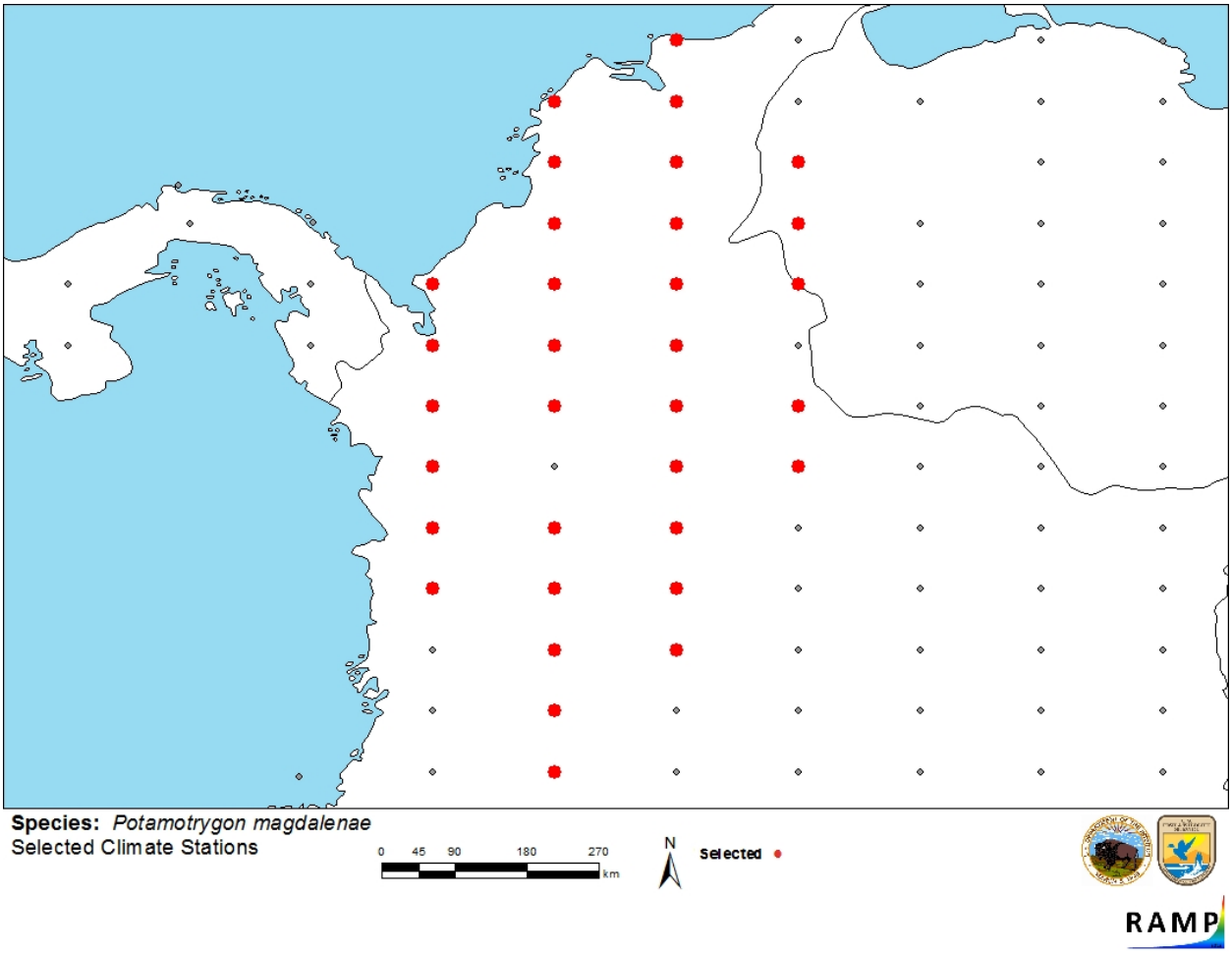

Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in northern South America selected as source locations (red; Colombia, Venezuela) and non-source locations (gray) for *Potamotrygon magdalenae* climate matching. Source locations from GBIF Secretariat (2018). Selected source locations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

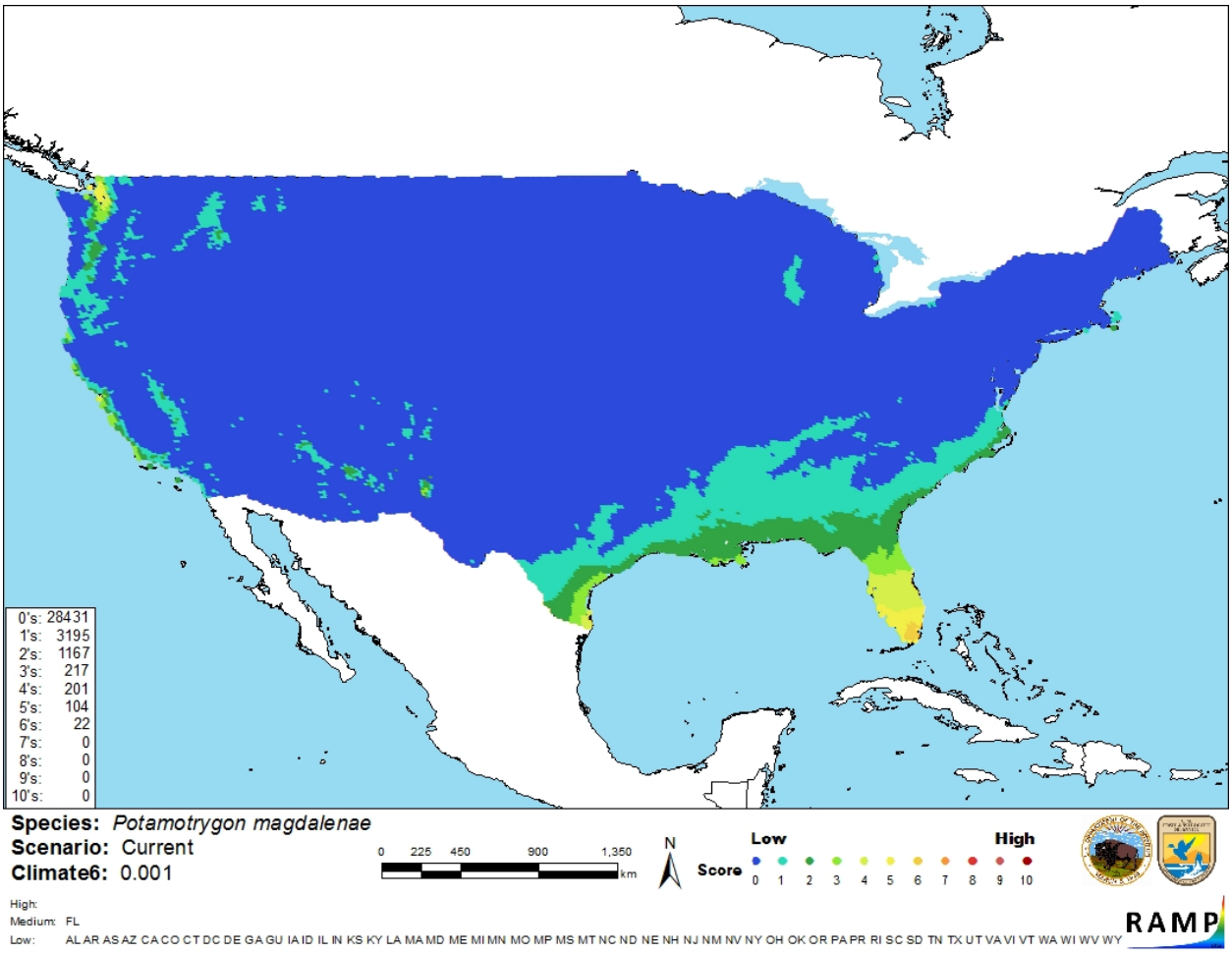

Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Potamotrygon magdalenae* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match 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 is some quality biological and ecological information about this species. No records of introduction were found. Therefore there is no information on impacts of introduction to evaluate.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Magdalena River Stingray (*Potamotrygon magdalenae*) is a species of freshwater stingray native to river drainages in Colombia. It is used for some subsistence fishing, the juveniles are exported for the aquarium trade, and it is incidentally caught while fishing for other species. The tail spine on the stingray has the potential to inflict injuries on humans. Fear of stings leds to some by-caught individuals being killed. No records of trade in this species in the United States were found but it is regulated in multiple States. The history of invasiveness is classified as No Known Nonnative Population. No records of introduction were found. The species is in trade but information indicates low volumes of trade. The climate match with the contiguous United States was low. However, southern Florida had a medium climate match, and there were additional small areas of medium match in Texas, California, and Washington. 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:** The tail spine may cause injury to humans.
- **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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