Guaru (*Poecilia vivipara*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2011
Revised, February 2018
Web Version, 8/30/2019

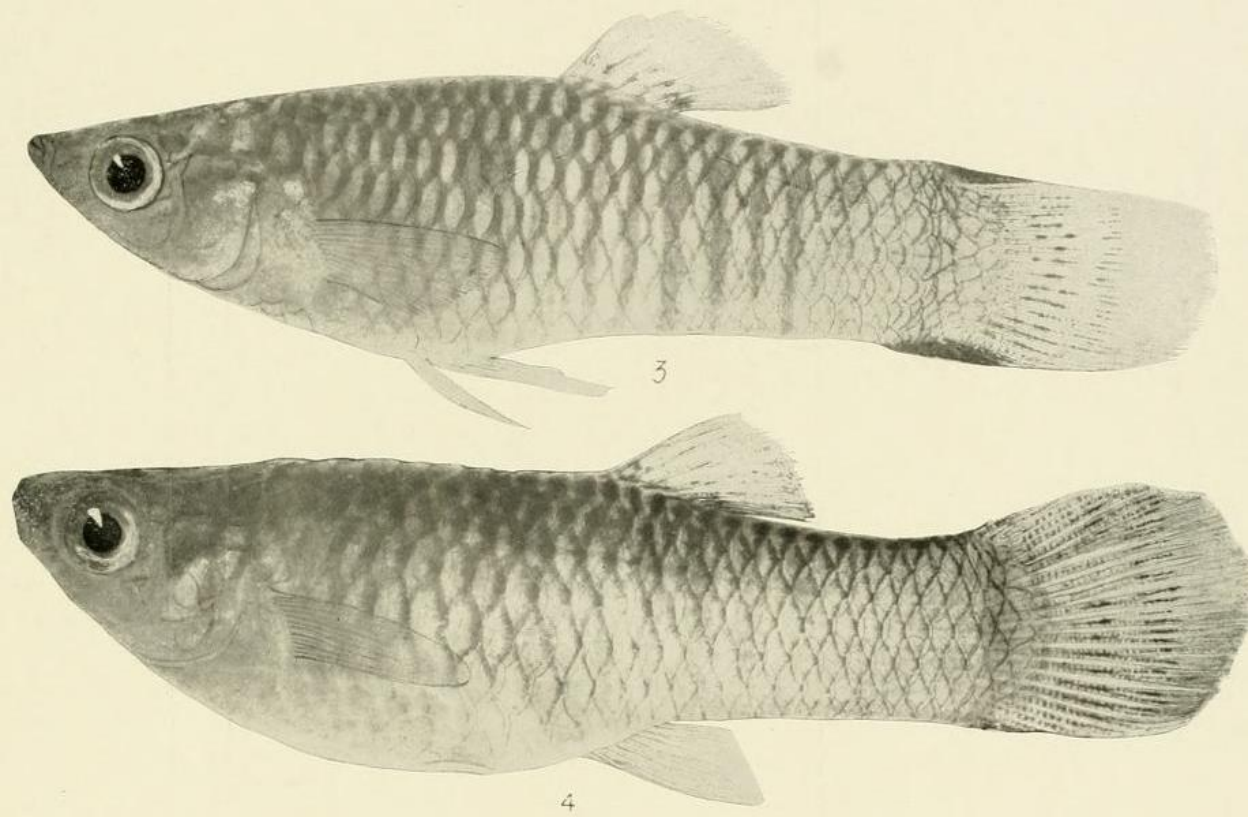

Image: C. H. Eigenmann. Public domain. Available: https://archive.org/stream/freshwaterfishes1912eige/freshwaterfishes1912eige#page/n740/mode/1up. (February 2018).

1 Native Range and Status in the United States

Native Range

From Eschmeyer et al. (2018):

"Distribution: Venezuela to Brazil; also islands of the Lesser Antilles: Brazil, French Guiana, Guyana, […] Suriname, Trinidad and Tobago, Uruguay and Venezuela."

Status in the United States

From Neilson (2019):

"Introduced to Puerto Rico (Smith 1997)."

"**Status:** Established in Puerto Rico."

A New Jersey-based aquarium retailer discusses keeping *P. vivipara* in aquaria in a 2014 blog post (Absolutely Fish 2014), but we did not find online retailers currently selling this species in the United States.

Means of Introductions in the United States

From Neilson (2019):

"Myers (1938) suggested that *P. vivipara* was introduced to Puerto Rico by humans, or less likely through colonization from South America."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Cyprinodontiformes
Suborder Cyprinodontoidei
Family Poeciliidae
Subfamily Poeciliinae
Genus *Poecilia*
Species *Poecilia vivipara* Bloch and Schneider, 1801"

From Eschmeyer et al. (2018):

"Current status: Valid as *Poecilia vivipara* Bloch & Schneider 1801. Poeciliidae: Poeciliinae."

Size, Weight, and Age Range

From Froese and Pauly (2017):

"Max length : 7.8 cm TL male/unsexed; [da Costa et al. 2014]; common length : 3.8 cm SL male/unsexed; [Paepke and Meyer 1995]; max. published weight: 6.48 g [da Costa et al. 2014]"

Environment

From Froese and Pauly (2017):

"Freshwater; brackish; benthopelagic; pH range: 7.0 - 8.2; dH range: 10 - 40; […] 26°C - 28°C [Baensch and Riehl 1985; assumed to be recommended aquarium temperatures]"

Climate/Range

From Froese and Pauly (2017):

"Tropical […]"

Distribution Outside the United States

Native

From Eschmeyer et al. (2018):

"Distribution: Venezuela to Brazil; also islands of the Lesser Antilles: Brazil, French Guiana, Guyana, […] Suriname, Trinidad and Tobago, Uruguay and Venezuela."

Introduced

From Eschmeyer et al. (2018):

"[…] Martinique (introduced) […]"

According to Froese and Pauly (2019), *P. vivipara* is established in Martinique.

Means of Introduction Outside the United States

From Froese and Pauly (2019):

"unknown"

Short Description

From Froese and Pauly (2017):

"Dorsal spines (total): 0; Dorsal soft rays (total): 6-8; Anal spines: 0; Anal soft rays: 7 – 9"

From Poeser (2003):

"LLS [lateral line scales] = 24-26; CPS [scales around the caudal peduncle] = 16."

"*Poecilia vivipara* may have a midlateral spot or blotch in both sexes, a unique character in the subgenus. The gonopodium has no extruding hooks or spines, gonopodial ray 4a with serrae on dorsal surface."

"Medium sized species, mature males smaller than 50 mm and females smaller than 60 mm. The body is truncate and displays dark stripes on the sides. The caudal and dorsal fins have black markings, with broad yellow margins. The caudal fin has black margins, at the base broader than at the terminal end. There is some variation in the presence of absence of the spot at the side of the body. No extensive records are available of the extent of this variation. In the populations in which it is present, the blotch is also prominent in young specimens."

Biology

From Froese and Pauly (2017):

"Widespread in mildly brackish water in canals and drainage ditches at the edges of swamps, but rarely found in freshwater. Feeds on mosquito larvae and has at times been used for control in ponds and reservoirs [Keith et al. 2000]."

"Males are very active and also approach the females of other Poecilinae. [Females produce 6 - 10 offspring which follow their mother for a few hours after birth, referring to [Keith et al. 2000]] After 28 days gestation, female gives birth to 100 young or more. Sexual maturity is reached after 3-4 months [Baensch and Riehl 1985]."

From Sommer-Trembo et al. (2017):

"The species […] occurs in several dozen coastal lagoons in northern Rio de Janeiro state in Brazil, where different populations experience pronounced variation in salinity, ranging from oligosaline (0.2 ppt) to hypersaline, that is, more than twice marine salinity (74 ppt; Di Dario et al., 2013; Correia, 2015). Organisms living under such inhospitable conditions are commonly referred to as "extremophiles" and exhibit an array of physiological and behavioral adaptations to cope with the stressors they are exposed to (Laverty & Skadhauge, 2015; Plath, Tobler, & Riesch, 2015). Constant winds on the shallow water bodies determine generally high levels of dissolved oxygen, but water transparency is highly variable among lagoons due to resuspension of sediments, microalgae concentrations, and dis-solved organic carbon (Caliman et al., 2010)."

From Gomes, Jr. and Monteiro (2007):

"The trahira is the main predator of *P. vivipara* (Mazzoni & Iglesias-Rios, 2002), mostly in the juvenile and adult stage (Winemiller, 1989) […]"

Human Uses

From Froese and Pauly (2017):

"Fisheries: of no interest"

"Feeds on mosquito larvae and has at times been used for control in ponds and reservoirs [Keith et al. 2000]."

A New Jersey-based aquarium retailer discusses keeping *P. vivipara* in aquaria in a 2014 blog post (Absolutely Fish 2014), but we did not find online retailers currently selling this species in the United States.

Diseases

No OIE-listed diseases (OIE 2019) have been documented for this species.

From Santos et al. (2011):

"This fish has found to be naturally parasitized by metacercariae of *Pygidiopsis macrostomum* Travassos, 1928, *Ascocotyle* (*Phagicola*) *pindoramensis* Travassos, 1928, *Ascocotyle* (*Phagicola*) *diminuta* (Stunkard and Haviland, 1924) and *Acanthocollaritrema umbilicatum* Travassos, Freitas and Bührnheim, 1965 in the Rodrigo de Freitas lagoon at Rio de Janeiro."

Threat to Humans

From Froese and Pauly (2017):

"Harmless"

3 Impacts of Introductions

No information available.

4 Global Distribution

Figure 1. Known global distribution of *Poecilia vivipara*, reported from South America and the Caribbean. Map from GBIF Secretariat (2019). A point in Greece was excluded from this map and from the climate match analysis as an outlier because not enough information exists to determine if the record is valid or if it represents an established population. The point in Mato Grosso Do Sul, Brazil, was excluded from the climate matching analysis because the coordinates do not match the verbal description of the location.

5 Distribution Within the United States

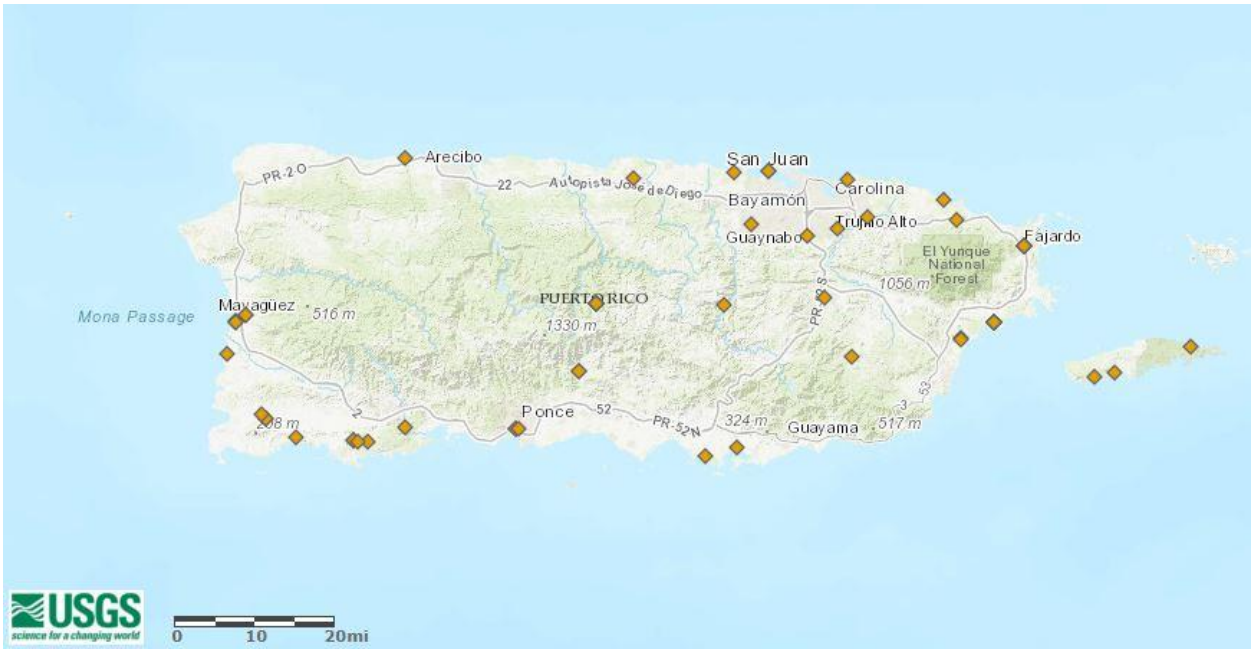

Figure 2. Known distribution of *Poecilia vivipara* in the United States territory of Puerto Rico. Map from Neilson (2018).

6 Climate Matching

Summary of Climate Matching Analysis

The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.021, indicating a medium overall climate match. (Scores between 0.005 and 0.103 are classified as medium.) The climate score was high in Florida and Louisiana. Alabama, Mississippi, and Texas had a medium climate score. Locally, the climate match was high in peninsular Florida and along much of the Gulf Coast, with the highest match occurring near Miami. The climate match was medium in coastal areas from New Jersey to Florida, in southern California, and surrounding high match areas along the Gulf Coast. Except for the areas just mentioned, the climate match was low across the western and central contiguous United States, and in the Northeast.

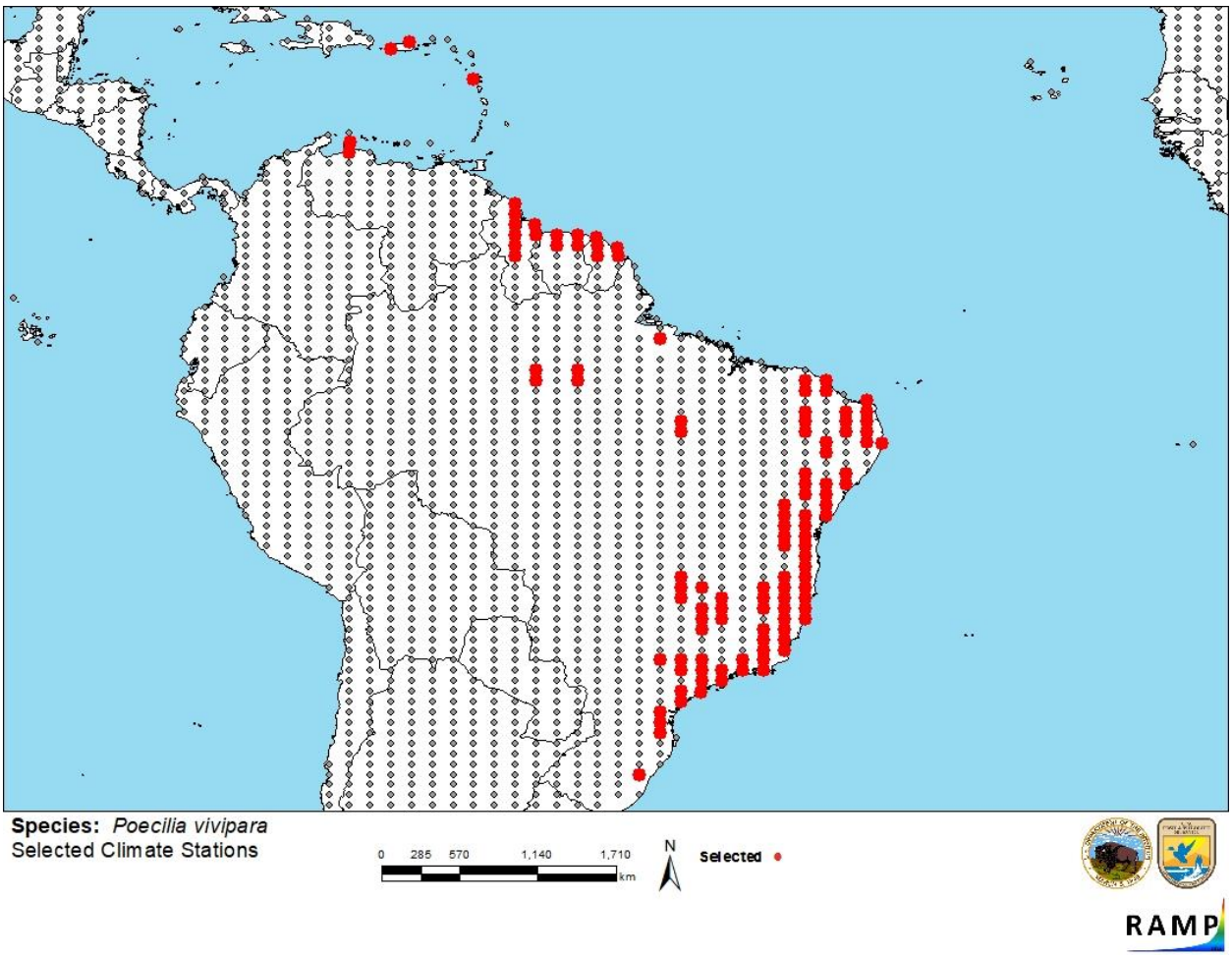

Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations selected as source locations (red; Puerto Rico, Martinique, Venezuela, Guyana, Suriname, French Guiana, Brazil) and non-source locations (gray) for *Poecilia vivipara* climate matching. Source locations from GBIF Secretariat (2019).

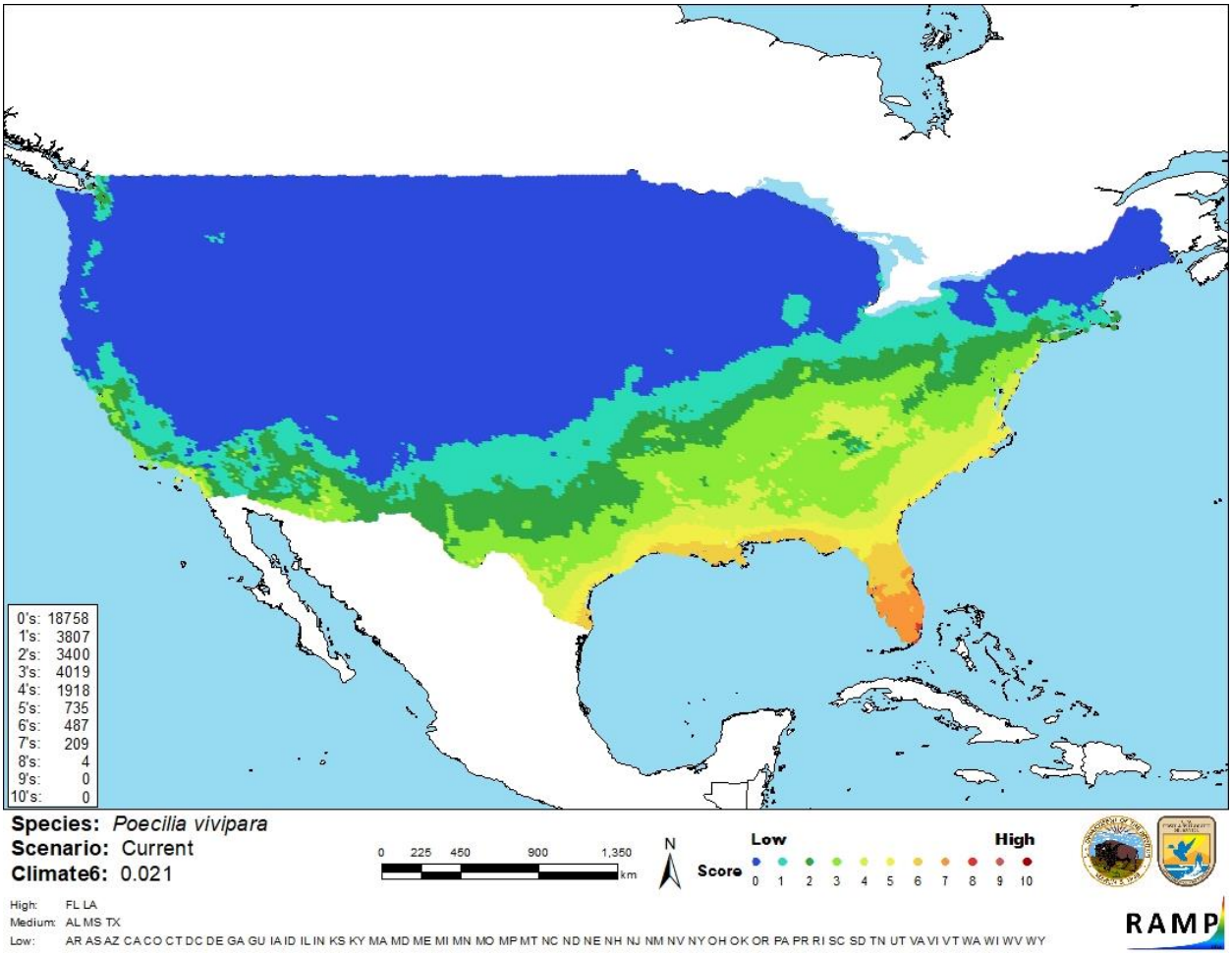

Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Poecilia vivipara* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). 0 = Lowest match, 10 = Highest match.

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

There is adequate information available on the biology and distribution, both native and introduced, of *Poecilia vivipara*. Despite this, there are no documented impacts of introductions of this species. Further information is needed to adequately assess the risk this species poses to the contiguous United States. Certainty of this assessment is therefore low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Poecilia vivipara, Guaru, is a poeciliid fish native to South America, ranging from Suriname to Brazil. It has been used for mosquito control and may occur in the aquarium trade. This species has been introduced outside of its native range in Puerto Rico and the Lesser Antilles Islands. Despite this, there are no documented impacts of introductions of this species. History of invasiveness is classified as none documented. Further information is needed to assess the risk this species poses, so certainty of this assessment is low. *P. vivipara* has a medium climate match with the contiguous United States, with the area of highest match in Florida. The overall risk assessment category for this species is "Uncertain".

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Medium**
- **Certainty of Assessment (Sec. 7): 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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