Moonlight Gourami (*Trichopodus microlepis*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, November 2014
Revised, December 2017
Web Version, 9/11/2019

Photo: Greg Hume. Licensed under Creative Commons BY-SA 3.0 Unported. Available: https://commons.wikimedia.org/wiki/File:Moonlight_Gourami.jpg. (November 7, 2014).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2017):

"Asia: originally occurring in the Mekong in Cambodia and Viet Nam and Chao Phraya basins [Kottelat 2001]."

"Occurs in the Mekong basin [Cambodia] [Rainboth 1996]. Found around the Tonle Sap Great Lake and river [Thuok and Sina 1997]. Known from Réam, Kompong Réat, Stung Sang [Kottelat 1985] and Sangke river [sic], Battambang province [Rot 2002]."

"Naturally found in the Chao Phraya basin [Thailand] [Kottelat 2001]. […] Recorded also from the Maeklong basin [Vidthayanon et al. 1997]; also from Bangkok, Tha Chin river [sic] (Samut Sakhon), Mepoon (Phrae), Phra Nakhon Si Ayutthaya, Songkhla and Nakhon Sawan [Monkolprasit et al. 1997]."

"Occurs in the Mekong basin [Viet Nam] [Kottelat 2001]."

From Vidthayanon (2012):

"[…] its natural range requires some confirmation."

Status in the United States

No records of *Trichopodus microlepis* in the wild in the United States were found.

Trichopodus microlepis is in trade in the United States.

From Arizona Aquatic Gardens (2019):

"Moonlight Gourami
$9.99"

Means of Introductions in the United States

No records of *Trichopodus microlepis* in the United States were found.

Remarks

The valid name for this species is *Trichopodus microlepis* (Eschmeyer et al. 2017). Some databases still use an older previously valid name, *Trichogaster microlepis* (ITIS 2017). To ensure completeness of data used for this assessment, information searches were conducted using both names.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Eschmeyer et al. (2017):

"**Current status:** Valid as *Trichopodus microlepis* (Günther 1861)."

From Froese and Pauly (2019):

"Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > […] Actinopterygii (Class) > Perciformes (Order) > Anabantoidei (Suborder) > Osphronemidae (Family) > Luciocephalinae (Subfamily) > *Trichopodus* (Genus) > *Trichopodus microlepis* (Species)"

Size, Weight, and Age Range

From Froese and Pauly (2017):

"Max length : 13.0 cm SL male/unsexed; [Kottelat 2001]"

From Kheng and Ingólfsson (2008):

"[…] with size up to 15 cm."

Environment

From Froese and Pauly (2017):

"Freshwater; demersal; pH range: 6.0 - 7.0; dH range: 2 – 25. […]; 26°C - 30°C [assumed to be recommended aquarium temperature range] [Riehl and Baensch 1991]"

Climate/Range

From Froese and Pauly (2017):

"Tropical; […]"

Distribution Outside the United States

Native

From Froese and Pauly (2017):

"Asia: originally occurring in the Mekong in Cambodia and Viet Nam and Chao Phraya basins [Kottelat 2001]."

"Occurs in the Mekong basin [Cambodia] [Rainboth 1996]. Found around the Tonle Sap Great Lake and river [Thuok and Sina 1997]. Known from Réam, Kompong Réat, Stung Sang [Kottelat 1985] and Sangke river [sic], Battambang province [Rot 2002]."

"Naturally found in the Chao Phraya basin [Thailand] [Kottelat 2001]. […] Recorded also from the Maeklong basin [Vidthayanon et al. 1997]; also from Bangkok, Tha Chin river [sic] (Samut Sakhon), Mepoon (Phrae), Phra Nakhon Si Ayutthaya, Songkhla and Nakhon Sawan [Monkolprasit et al. 1997]."

"Occurs in the Mekong basin [Viet Nam] [Kottelat 2001]."

Introduced

Froese and Pauly (2017) lists *Trichopodus microlepis* as introduced and established or probably established in Singapore, Taiwan, and Colombia. It is listed as recorded but status unknown in Malaysia and the Philippines.

From Froese and Pauly (2017):

“Introduced in the Mekong basin in Thailand [but native in other areas of that basin and other basins within Thailand] and expected in Laos [Kottelat 2001].”

“Established in the Magdalena and Orinoco watersheds [in Colombia].”

Means of Introduction Outside the United States

From Froese and Pauly (2017):

“A popular aquarium species which appeared in Colombia because of escapes from aquarium rearing facilities [Welcomme 1988].”

From FAO (2013):

“Reasons of Introduction: 1) ornamental”

From Vidthayanon (2012):

“Introduced in the Mekong basin [in Thailand] (Kottelat 2001) and elsewhere as a result of introductions arising from the ornamental fish trade; […]”

Short Description

From Froese and Pauly (2017):

“Dorsal spines (total): 3 - 4. *Trichopodus microlepis* is distinguished from other congeners by having the following characters: body silvery or grey without distinct markings; dorsal fin with 3-4 spines; 57-65 scales on lateral line; 34-40 transverse scales; and length of dorsal-fin base 14.5-17.3% SL [Low et al. 2014].”

Biology

From Froese and Pauly (2017):

“Found in ponds and swamps [Kottelat 2001]. Occurs in shallow sluggish or standing water habitats with a lot of aquatic vegetation. Common in the floodplain of the lower Mekong. Feeds on zooplankton, crustaceans and aquatic insects.”

“Builds bubble nest. Produces 500-1000 eggs.”

Human Uses

From Froese and Pauly (2017):

“Fisheries: minor commercial; aquarium: highly commercial”

“Marketed fresh [Rainboth 1996].”

"[…], also available in pet stores in the country [Taiwan] [Liang et al. 2006]."

"Reared in captivity [in Thailand] for the ornamental fish trade [Ukkatawewat 2005]."

From Vidthayanon (2012):

"Locally consumed, and reared in captivity for the ornamental fish trade (Ukkatawewat 1984), although this is assumed to be in small quantities, as the species is not common in the ornamental trade."

Trichopodus microlepis is in the aquarium trade in Greece (Papavlasopoulou et al. 2014).

Diseases

Epizootic ulcerative syndrome is on the 2017 list of OIE reportable diseases.

From Froese and Pauly (2017):

"Costia Disease, Parasitic infestations (protozoa, worms, etc.)
Dactylogyrus Gill Flukes Disease, Parasitic infestations (protozoa, worms, etc.)
Pop-eye disease, Bacterial diseases
Bacterial Infections (general), Bacterial diseases"

From Jeong et al. (2008):

"Clinical ISKNV [infectious spleen and kidney necrosis virus] infection occurred naturally in 3 species, pearl, dwarf and silver gourami [*Trichopodus microlepis*], […]"

"In the present study pearl gourami and silver gourami [*Trichopodus microlepis*] were susceptible to PGIV-1 [Pearl Gourami iridovirus] […]"

Yooyen et al. (2006) list *Clinostomum philippinensis* as a parasite of *Trichopodus* (*Trichogaster*) *microlepis*.

From Afzali et al. (2013):

"[…] in the tropical moonlight gourami (*Trichogaster* [*Trichopodus*] *microlepis*), a highly EUS [epizootic ulcerative syndrome] –susceptible fish, […]"

From Chontananarth et al. (2014):

"[…] *H*[*aplorchis*]. *pumilio* [was collected] from Moonlight Gourami (*Trichogaster* [*Trichopodus*] *microlepis*), […]"

Rojekittikhun et al. (2002) list *Trichopodus microlepis* as naturally infected with *Gnathostoma spinigerum* larvae.

Threat to Humans

From Froese and Pauly (2017):

"Harmless"

From Rojekittikhun et al. (2002):

"Human gnathostomiasis is a disease primarily caused by larval and immature stages of *G. spinigerum* (Daengsvang, 1980; Miyazaki, 1991). [Authors list *Trichopodus microlepis* as naturally infected with *Gnathostoma spinigerum* larvae.]"

3 Impacts of Introductions

From Froese and Pauly (2017):

"Significant socio-economic effects [in Colombia]: some – beneficial"

4 Global Distribution

Figure 1. Known global distribution of *Trichopodus microlepis*. Locations are in Thailand and Cambodia. Map from Froese and Pauly (2017).

Figure 2. Known global distribution of *Trichopodus microlepis*. Map from GBIF Secretariat (2017).

Figure 3. Known global distribution of *Trichopodus microlepis*. Map from VertNet (2017).

Trichopodus microlepis has been introduced and established in Colombia (FAO 2013; Froese and Pauly 2017), the most detailed location information available was the river basins the species is recorded in. That does not provide enough detail to be able to choose source points to represent this population in the climate match. *T. microlepis* is also native to Vietnam, and established or probably established in Singapore and Taiwan, but georeferenced observations are not available in those locations.

5 Distribution Within the United States

No records of *Trichopodus microlepis* in the United States were found.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Trichopodus microlepis* was medium for much of southern Florida and southern Texas. The climate match was low everywhere else and there were no areas of high match. The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the 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 6 scores.

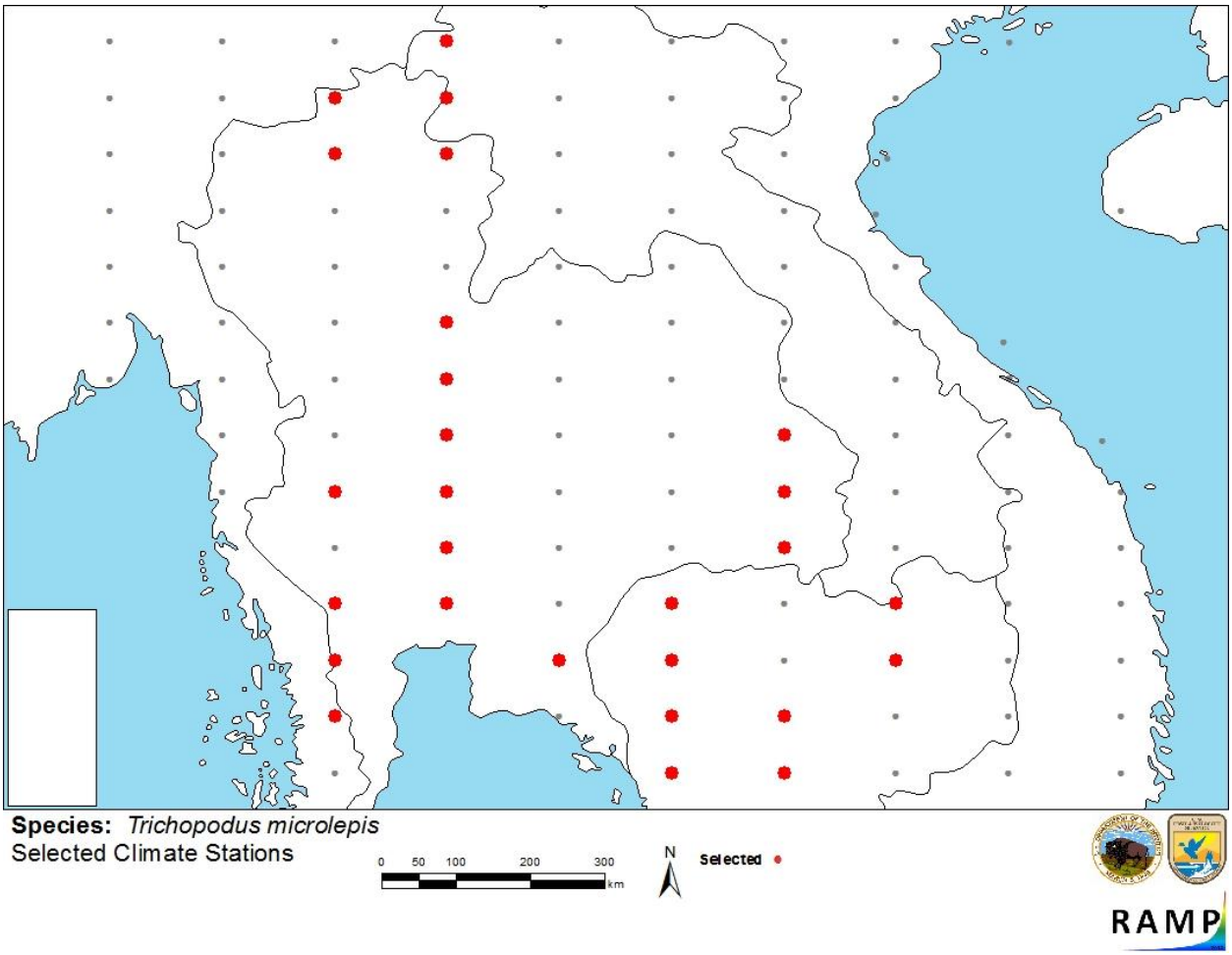

Figure 4. RAMP (Sanders et al. 2014) source map showing weather stations in Thailand, Cambodia, and Myanmar selected as source locations (red) and non-source locations (grey) for *Trichopodus microlepis* climate matching. Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves. Source locations from Froese and Pauly (2017), GBIF Secretariat (2017), and VertNet (2017).

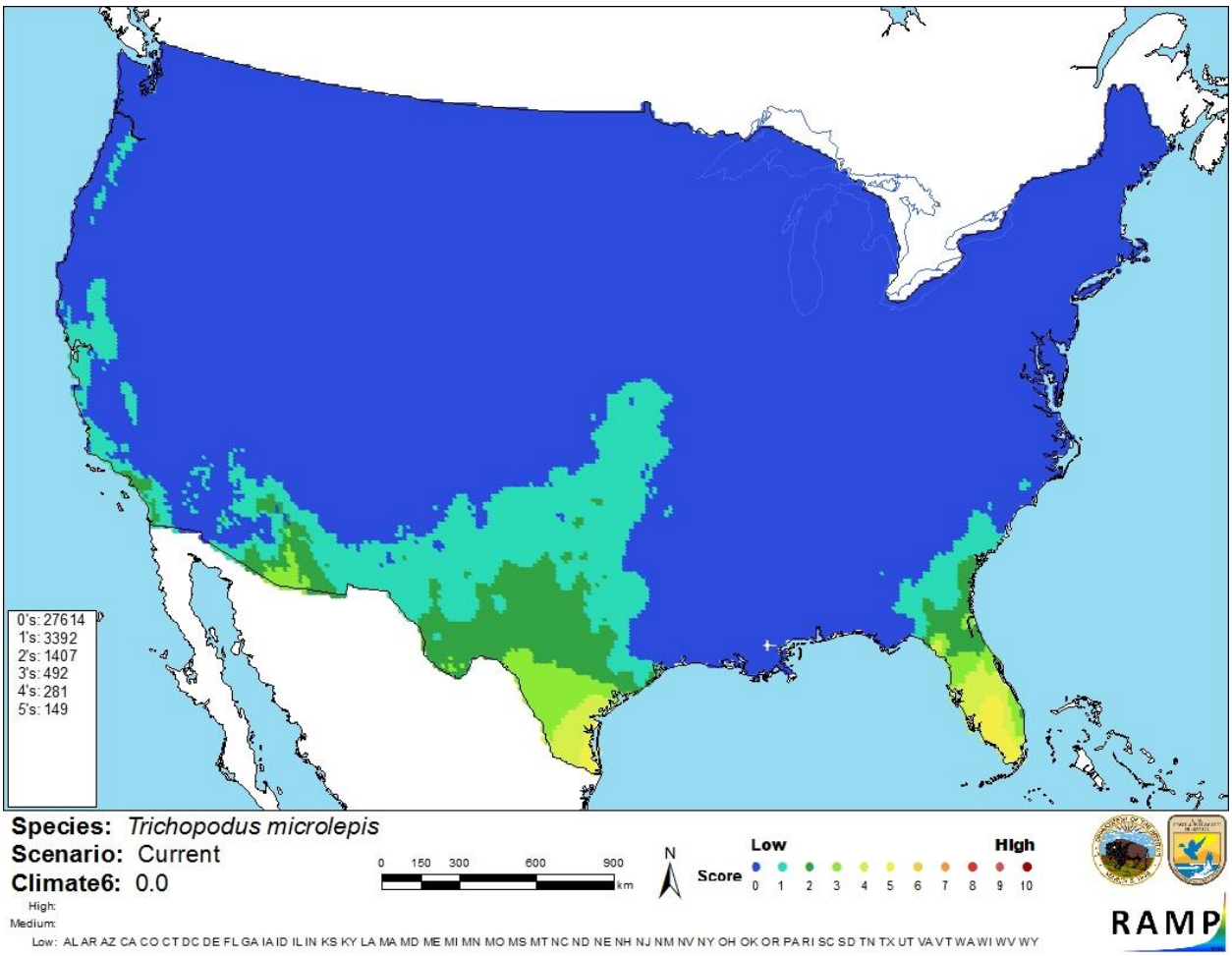

Figure 5. Map of RAMP (Sanders et al. 2014) climate matches for *Trichopodus microlepis* in the contiguous United States based on source locations reported by Froese and Pauly (2017), GBIF Secretariat (2017), and VertNet (2017). 0 = Lowest match, 10 = Highest match.

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 was a moderate amount of information available for *Trichopodus microlepis*. Records of introductions were found but only a single, much generalized record of a beneficial economic impact was found. Specific location information was not available for all introductions. The certainty of assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Moonlight Gourami (*Trichopodus microlepis*) is native to areas of the Mekong and Chao Phraya river basins in Southeast Asia. It is a popular species in the aquarium industry. The history of invasiveness for *T. microlepis* is None Documented. Introductions have occurred in multiple countries primarily due to aquarium and aquaculture escapes and some of those introductions have resulted in established populations. It is unknown what ecological impacts those introductions have caused. Froese and Pauly (2017) reported some beneficial socioeconomic effects in Colombia, but no further detail was provided about those benefits. The climate match is low, with areas of medium match in southeastern Texas and southern Florida. The certainty of assessment is low due to portions of the species distribution not represented in the climate match and a lack of information on impacts of introduction. The overall risk assessment is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information:** *Trichopodus microlepis* can be a carrier for the pathogen that causes human gnathostomiasis. It can also carry epizootic ulcerative syndrome, an OIE reportable disease.
- **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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