

Green Barb (*Barbodes semifasciolatus*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, June 2019
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https://en.wikipedia.org/wiki/Gold_barb#/media/File:Puntius_semifasciolatus.png. (June 2019).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019a):

“Asia: Red River basin, southwestern China, including Hainan [Kottelat 2001].”

From Nico et al (2019):

“Native Range: Asia. Southeastern China from Hong Kong to the island of Hainan (Petrovicky 1988); Laos (Kottelat 2001); Vietnam and Thailand (museum records).”

Froese and Pauly (2019a) also lists *Barbodes semifasciolatus* as native to Taiwan.

Status in the United States

From Nico et al (2019):

“This species was introduced to Nu'uanu Reservoir in Oahu, Hawaii in 1940, [...]”

“Extirpated after the drought of 1984 when the reservoir dried (Yamamoto and Tagawa 2000; Mundy 2005).”

From Froese and Pauly (2019a):

“The Chinese barb [*Barbodes semifasciolatus*] is only moderately successful in a reservoir in Oahu Island.”

Means of Introductions in the United States

From Froese and Pauly (2019a):

“Accidentally released from aquaria.”

From Nico et al (2019):

“Means of Introduction: According to Devick (1991b), this species was introduced from Asia for food and decoration.”

Remarks

Barbodes semifasciolatus was previously known as *Puntius semifasciolatus*, therefore a search was conducted using both names.

A previous version of this ERSS was published in 2017 under the name *Puntius semifasciolatus*. Revisions were done to incorporate new information and to bring the document in line with current standards.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al (2019):

“**Current status:** Valid as *Barbodes semifasciolatus* (Günther 1868).”

From Froese and Pauly (2019b):

“Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > [...] Actinopterygii (Class) > Cypriniformes (Order) > Cyprinidae (Family) > Barbinae (Subfamily) > *Barbodes* (Genus) > *Barbodes semifasciolatus* (Species)”

Size, Weight, and Age Range

From Froese and Pauly (2019a):

“Max length : 7.0 cm TL male/unsexed; [Hwang et al 1988]; common length : 3.5 cm SL male/unsexed; [Nichols 1943]”

From Nico et al (2019):

“Size: 10 cm.”

Environment

From Froese and Pauly (2019a):

“Freshwater; benthopelagic; pH range: 6.0 - 8.0; dH range: 5 - 19; depth range 0 - 5 m [Shao and Lim 1991]. [...]; 18°C - 24°C [Riehl and Baensch 1991] [assumed to be the recommended aquarium temperature]; [...]”

Climate/Range

From Froese and Pauly (2019a):

“Subtropical; [...]; 24°N - 20°N, 102°E - 108°E”

Distribution Outside the United States

Native

From Froese and Pauly (2019a):

“Asia: Red River basin, southwestern China, including Hainan [Kottelat 2001].”

From Nico et al (2019):

“Native Range: Asia. Southeastern China from Hong Kong to the island of Hainan (Petrovicky 1988); Laos (Kottelat 2001); Vietnam and Thailand (museum records).”

Froese and Pauly (2019a) also lists *Barbodes semifasciolatus* as native to Taiwan.

Introduced

From Nico et al (2019):

“*Puntius semifasciolatus* is established on Singapore where it was introduced sometime before 1912 (Alfred 1966; Ng et al. 1993), was reported from a swamp in Papua New Guinea in 1966 (Glucksman et al. 1976), [...]”

Froese and Pauly (2019a) list the status of *Barbodes semifasciolatus* as not established in Papua New Guinea.

From Svirsky and Barbanshchikov (2010):

“All invaders may be conventionally divided into three groups: (1) neutral species present in the lake [Lake Khanka, Russia] ecosystem for a short period of time and triggering no disturbances in the biotic community (ochetobius, green barb, paddlefish); [...]”

From The Anh (2012):

“Presence in Mekong basin in northern Lao PDR and southern China (Yunnan) probably results from introductions, and it has been introduced elsewhere (Welcomme 1988).”

Means of Introduction Outside the United States

From Svirsky and Barbanshchikov (2010):

“[...] (d) accidental and intentional introductions as a result of water runoff from Chinese (*Ochetobius elongatus*, Asian carps, green barb [*Barbodes semifasciolatus*], clear-head icefish, some species of bitterlings) and Russian (various breeds and hybrid forms of domesticated common carp and wild carp, paddlefish) fish farms; [...]”

Short Description

From Froese and Pauly (2019a):

“Body with 4-7 narrow bars, more or less complete or dissociated into series of spots; complete lateral line; last simple dorsal ray serrated posteriorly; yellowish in color [Kottelat 2001].”

From Alfred (1966):

“Dorsal rays III. 8-9; anal iii. 5; pectoral i. 11-13; ventral i. 7-8. Lateral line complete, incomplete, or interrupted. Lateral line scales 21-23; transverse scales $3\frac{1}{2}/1/4\frac{1}{2}$; predorsals 8-10; circumpeduncular scales $2\frac{1}{2}/1/2\frac{1}{2}$. Depth 2.7-3.1; head 2.8-3.4; predorsal length 1.7-1.9; eye 2.9-3.6; snout 3.1-4.0; interorbital width 2.5-3.1; standard length 17.7-40.0 mm; total length 23.5-52.8 mm. Dorsal origin slightly behind that of ventrals and opposite 8th scale of lateral line. Origin of ventrals opposite 7th lateral line scale and separated from it by 3 scales. Anal origin opposite 13th or 14th lateral line scale and separated from it by 3 scales. A pair of maxillary barbels, equal to 0.3 to 0.4 times eye diameter.

Colouration (in preserved specimens). Dusky above whitish below, with a variable number of spots, blotches and bars on the side. In all the specimens there is a black, vertical bar behind the head opposite the pectorals, followed by a second bar opposite the dorsal, behind which is a third bar or spot opposite the anal and finally a precaudal spot. Additional spots, blotches or bars may be present between these markings. A dark spot at the base of the dorsal spines, and a supra-anal spot present. Dorsal, anal, and caudal fins slightly dusky, other fins hyaline. In life, the colouration is as described but the body is silvery yellow.”

Biology

From Froese and Pauly (2019a):

“Adults feed on worms, crustaceans, insects, plant matter [Mills and Vevers 1989] and detritus [Man and Hodgkiss 1981].”

“Spawns during early morning hours.”

“nonguarders
open water/substratum egg scatterers”

From The Anh (2019):

“Found in flowing streams and tributaries, as well as small lakes.”

Human Uses

From Froese and Pauly (2019a):

“Aquarium: highly commercial”

From The Anh (2012):

“Species is common in the aquarium trade however probably from cultivated sources (M. Kottelat pers. comm. 2011). Probably eaten at a subsistence scale.”

Diseases

From Froese and Pauly (2019a):

“White spot Disease, Parasitic infestations (protozoa, worms, etc.)
Bacterial Infections (general), Bacterial diseases”

White spot disease is an OIE-reportable disease (OIE 2019).

Threat to Humans

From Froese and Pauly (2019a):

“Harmless”

3 Impacts of Introductions

From Nico et al (2019):

“Impact of Introduction: The impacts of this species are currently unknown, as no studies have been done to determine how it has affected ecosystems in the invaded range. The absence of data

does not equate to lack of effects. It does, however, mean that research is required to evaluate effects before conclusions can be made.”

From Svirsky and Barbanshchikov (2010):

“All invaders may be conventionally divided into three groups: (1) neutral species present in the lake [Lake Khanka, Russia] ecosystem for a short period of time and triggering no disturbances in the biotic community (ochetobius, green barb, paddlefish); [...]”

4 Global Distribution



Figure 1. Known global distribution of *Barbodes semifasciolatus*. Observations are reported from China, Taiwan, Vietnam, Laos, Thailand, South Africa, and the United States. Map from GBIF Secretariat (2019). The location in South Africa is not considered a source location and will not be used in the climate match due to no records of introduction. Location in the United States will not be considered as a source location because the population being extirpated due to climatic conditions (Nico et al. 2019).

Although there is a record of introduction for *Barbodes semifasciolatus* to Lake Khanka, Russia there is no evidence of establishment and the location was not used to select source points for the climate match.

5 Distribution Within the United States



Figure 2. Known distribution of *Barbodes semifasciolatus* in the United States. Location is on the island of Oahu in Hawaii. Map from Nico et al (2019). Location no longer represents an established population (extirpated due to drought), therefore it will not be considered in the climate match.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for the contiguous United States is generally low for *Barbodes semifasciolatus*. Areas of medium match were only found in states in the southeast; along the Gulf of Mexico and along the southern Atlantic Coast. Southern Florida had an area of high match. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for contiguous United States was 0.014, a medium climate score. (Scores between 0.005 and 0.103 are classified as medium.) All States had low individual Climate 6 scores except Florida, which had a high climate score, and Georgia, which had a medium climate score.

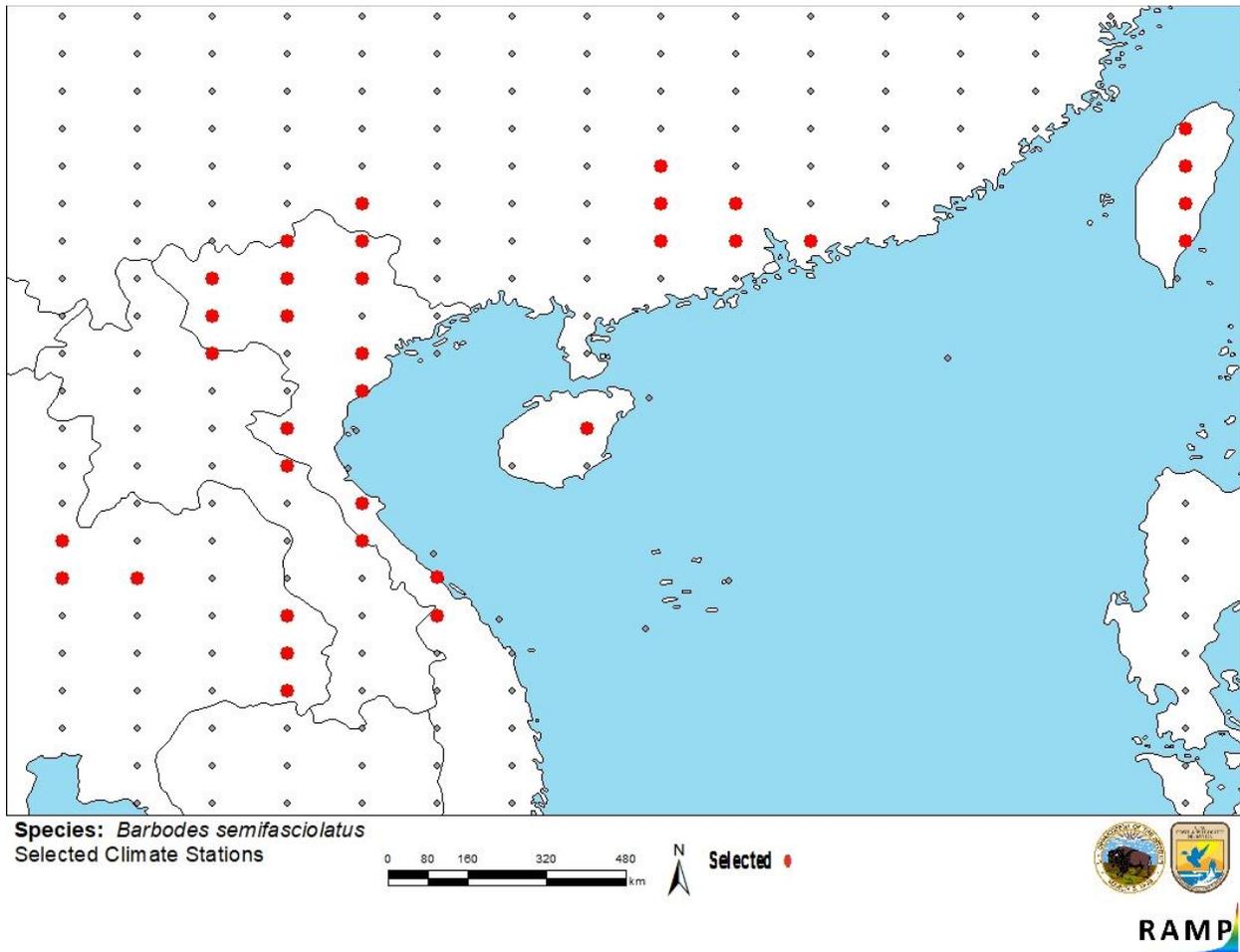


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in Southeastern Asia selected as source locations (red; China, Laos, Taiwan, Thailand, and Vietnam) and non-source locations (gray) for *Barbodes semifasciolatus* climate matching. Source locations from GBIF Secretariat (2019). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

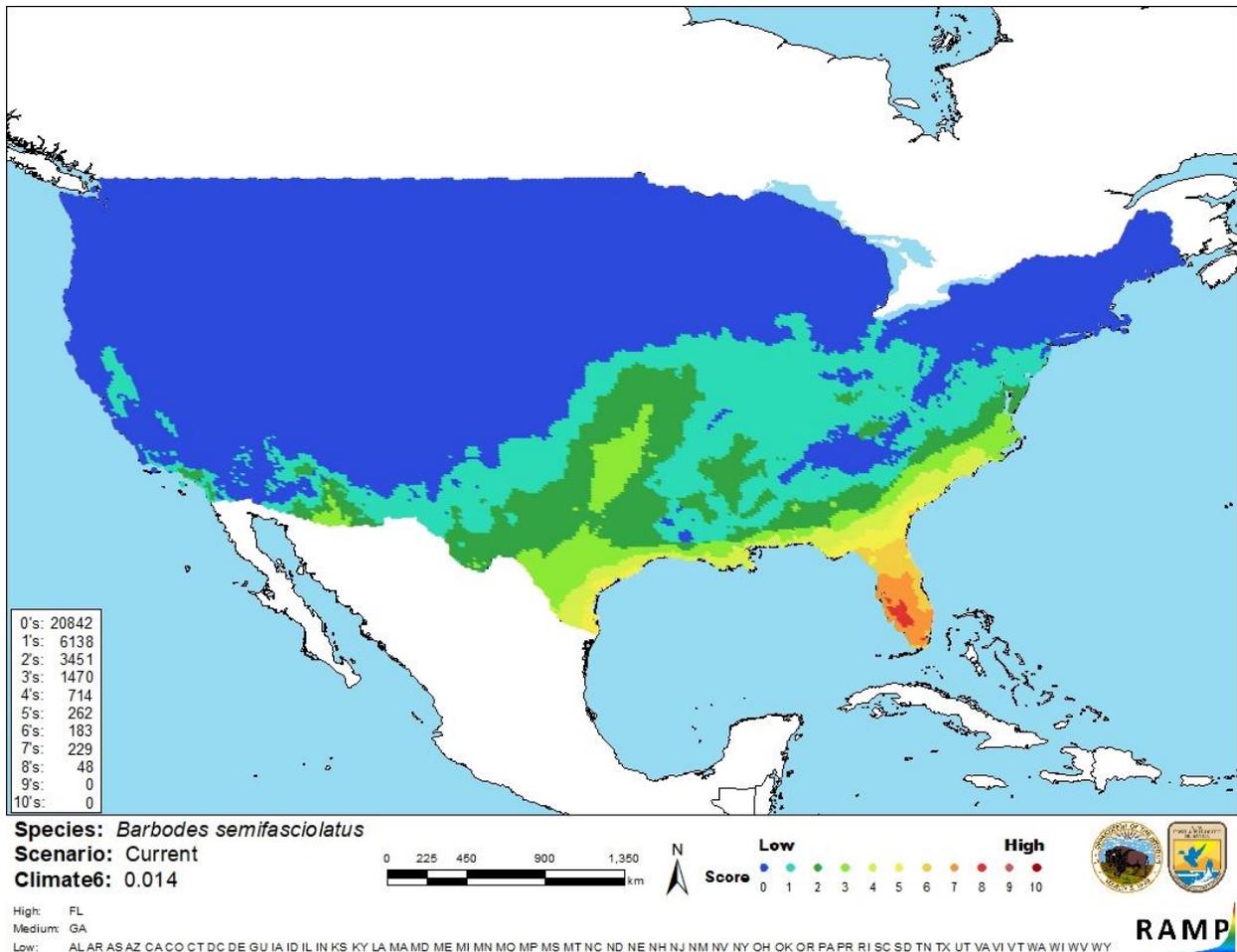


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Barbodes semifasciolatus* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). 0 = Lowest match, 10 = Highest match.

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
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

The certainty of assessment is low. Limited information is available on *Barbodes semifasciolatus*. This species has been reported as introduced but no scientifically defensible information has been documented in regards to the impacts of introduction.

8 Risk Assessment

Summary of Risk to the Contiguous United States

The Green Barb, *Barbodes semifasciolatus*, is a fish native to Southeastern Asia. It is found in southern China, Laos, Taiwan, Thailand, and Vietnam. *B. semifasciolatus* has been reported as introduced in Singapore, where it has become established, and in the United States in Hawaii where the species became established and then was extirpated after a drought. No information regarding impacts of introductions has been reported. History of invasiveness is classified as None Documented. This species is a highly commercialized fish, found in the aquarium trade as well as used as a food source. The climate match for the contiguous United States is medium. Most of the contiguous United States had low climate matches with areas of medium match along southeastern coastal areas and an area of high match in southern Florida. The certainty of assessment is low due to a lack of information about impacts of introduction. The overall risk assessment category for *Barbodes semifasciolatus* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Medium**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information:** *Barbodes semifasciolatus* can carry White spot disease, which is 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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