

Blue Panchax (*Aplocheilichthys panchax*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, April 2011

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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

“Asia: Pakistan, India, Bangladesh, Myanmar and the Indo-Malaysian archipelago. Reported from Nepal [Shrestha 1994] Cambodia, Viet Nam [Huber 1996] and Sri Lanka [Pethiyagoda 1991].”

Froese and Pauly (2019) list the following countries as native range: Andaman Island, Bangladesh, Cambodia, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Singapore, Sri Lanka, Thailand, and Viet Nam.

Status in the United States

Aplocheilus panchax has not been reported as in trade or as introduced or established in the wild in the United States.

Means of Introductions in the United States

Aplocheilus panchax has not been reported as introduced or established in the wild in the United States.

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2019):

“**Current status:** Valid as *Aplocheilus panchax* (Hamilton 1822).”

From ITIS (2019):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Cyprinodontiformes
Suborder Aplocheiloidei
Family Aplocheilidae
Subfamily Aplocheilinae
Genus *Aplocheilus*
Species *Aplocheilus panchax* (Hamilton, 1822)”

Size, Weight, and Age Range

From Froese and Pauly (2019):

“Max length : 9.0 cm TL male/unsexed; [Menon 1999]; common length : 5.0 cm TL male/unsexed; [Menon 1999]”

Environment

From Froese and Pauly (2019):

“Freshwater; brackish; benthopelagic; pH range: 6.0 - 8.0; dH range: 5 - 12; [...] 20°C - 25°C [Riehl and Baensch 1999; assumed to be recommended aquarium temperature]”

Climate/Range

From Froese and Pauly (2019):

“Tropical;”

Distribution Outside the United States

Native

From Froese and Pauly (2019):

“Asia: Pakistan, India, Bangladesh, Myanmar and the Indo-Malaysian archipelago. Reported from Nepal [Shrestha 1994] Cambodia, Viet Nam [Huber 1996] and Sri Lanka [Pethiyagoda 1991].”

Froese and Pauly (2019) list the following countries as native range: Andaman Island, Bangladesh, Cambodia, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Singapore, Sri Lanka, Thailand, and Viet Nam.

Introduced

According to Froese and Pauly (2019), *A. panchax* has been introduced to the Philippines, Timor-Leste, Indonesia, and Islands East of Wallace line.

“[Timor-Leste] Recorded from the Laleia River; Mota Monofohinum (Laclo River) [Larson and Pidgeon 2004].”

Means of Introduction Outside the United States

From Krishna et al. (2016):

“Gupta and Banerjee (2013) [...] Compared the mosquito biocontrol efficiency of *Poecilia reticulata* and *Aplocheilus panchax*, two popular fish species which so far have been used for mosquito biocontrol here in India which proved the Superiority of panchax minnow over guppy as mosquito biocontrol agent.”

From Job (1941):

“Experiments with *Aplocheilus panchax* by enclosing, channeling, screening, etc., of the marginal pits and field drains and in valve chambers clearly demonstrated the efficiency of the fish in larval control, and being the most widely distributed and easily acclimatized of Indian

Killifishes, *Aplocheilichthys panchax* is definitely found to be of great practical utility in anti-mosquito campaigns.”

Short Description

From Rajan and Sreeraj (2013):

“Diagnostic features: D. 8; A. 15; P. 14; V. 6. Ls. 33. Body elongate and compressed; eyes large, 3.3-3.4 in head; mouth terminal; anal fin square shaped; ventral fins small; caudal fin rounded. Upper part of body greenish, dull white ventrally; fins light yellow; a black at base of dorsal fin; margin of anal fin reddish.”

Biology

From Froese and Pauly (2019):

“Occurs in lowland wetlands to estuaries and peats [Vidhayanon 2002]. Found in ponds and ditches [Mohsin and Ambak 1983] canals [Rahman 1989], reservoirs and mangrove creeks [Lim and Ng 1990]. Prefers clear water in areas with dense growth of rooted or floating macrophytes [Rainboth 1996]. Sometimes occurring in hypersaline waters. Feeds mainly on insects [Lim and Ng 1990].”

“[...] non-migratory.”

“A perennial breeder [Huber 1996], both in fresh and brackish waters, particularly from November to March [Mills and Vevers 1989].”

From Chaudhry and Chakrabarty (2018):

“This species is a perennial breeder with a spawning maximum in the monsoon months. It breeds at 8 cm and attains a length of 9 cm. Maturity is attained in four to five months. The eggs, when laid, are attached to submerged vegetation and hatch out in 9-14 days depending on temperature, aeration and other physio-chemical conditions of the water.”

From Herder et al. (2012):

“This species is tolerant of increased salinity (Lim and Ng 1990), [...]”

Human Uses

From Froese and Pauly (2019):

“Rarely caught by commercial fishermen and not seen in markets [Rainboth 1996]. Popular aquarium fish [Vidhayanon 2002].”

According to Jayalal and Ramachandran (2012), *A. panchax* is a native fish from India found to be exported as an ornamental fish.

From Chaudhry and Chakrabarty (2018):

“This species is found in the aquarium trade, for mosquito control, and is used in the preparation of fish paste in Myanmar.”

Diseases

No records of OIE-reportable diseases (OIE 2019) were found for *Aplocheilus panchax*.

From Mondal and De (2001):

“The fish, *Aplocheilus panchax* (Hamilton–Buchanan, 1839), is recorded as a new host of *Aphanomyces laevis* de Bary, 1860. It is the first and only report of any oomycete causing disease on *A. panchax*. *Aphanomyces laevis* was found to be a virulent parasite of *A. panchax* that caused cotton-wool disease involving the skin and fins. The hyphae also penetrated deep into the tissues of the infected fish and all of them ultimately died.”

According to Poelen et al. (2014), *Aplocheilus panchax* is a host to the parasite *Paracapillaria philippinensis*.

Threat to Humans

From Froese and Pauly (2019):

“Harmless”

3 Impacts of Introductions

From Muchlisin (2012):

“The indiscriminate introduction of aquatic organisms from one habitat into another poses serious risks and represents a significant threat to aquatic biodiversity (Wellcomme 1988) since it can cause a decline in or even the extinction of endemic and native species (Lever 1996, Kumar 2000, Macneale et al. 2010).”

From Herder (2012):

“Endemic fishes of the Malili Lakes also likely suffer from diseases and parasites introduced with alien fishes.”

According to Polhemus et al. (2004), *A. panchax* could likely cause local extirpation of native invertebrates in New Guinea but currently impacts to native biota are unknown.

4 Global Distribution



Figure 1. Known global distribution of *Aplocheilus panchax*. Locations in Southern Asia and Seychelles Islands. Map from GBIF Secretariat (2019). Locations in the Seychelles Islands were not included as source locations in the climate match due to no documented established populations in those areas.

5 Distribution Within the United States

Aplocheilus panchax has no documented populations in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for the contiguous United States is generally low. There are two small areas of medium match at the most southern tip of Texas and the Florida peninsula. There are no areas of high match. The Climate 6 score (Sanders et al. 2018; 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.

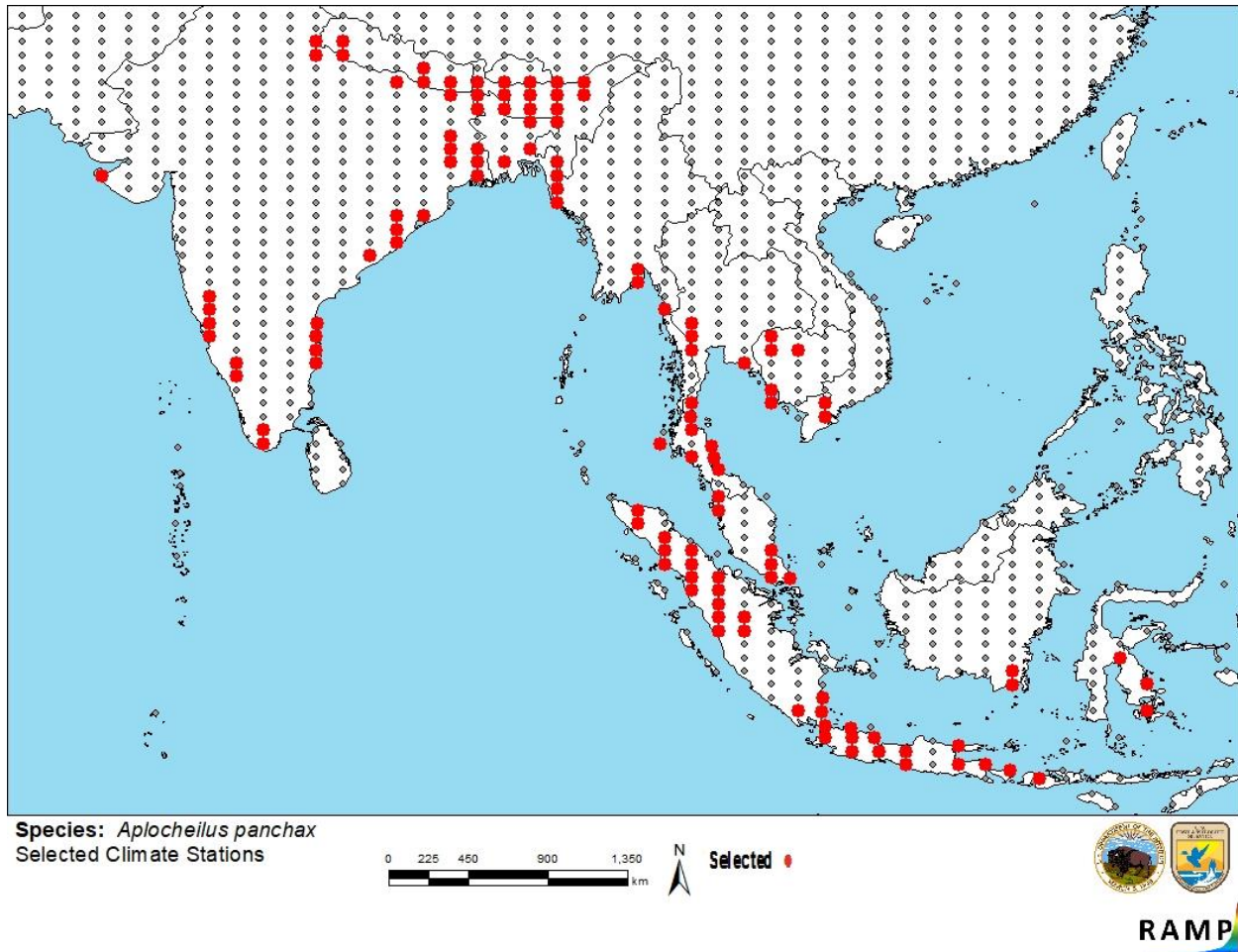


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in southern Asia selected as source locations (red; India, Nepal, Bhutan, Bangladesh, Myanmar, Thailand, Cambodia, Vietnam, Malaysia, Indonesia, Singapore) and non-source locations (gray) for *Aplocheilus panchax* climate matching. 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.

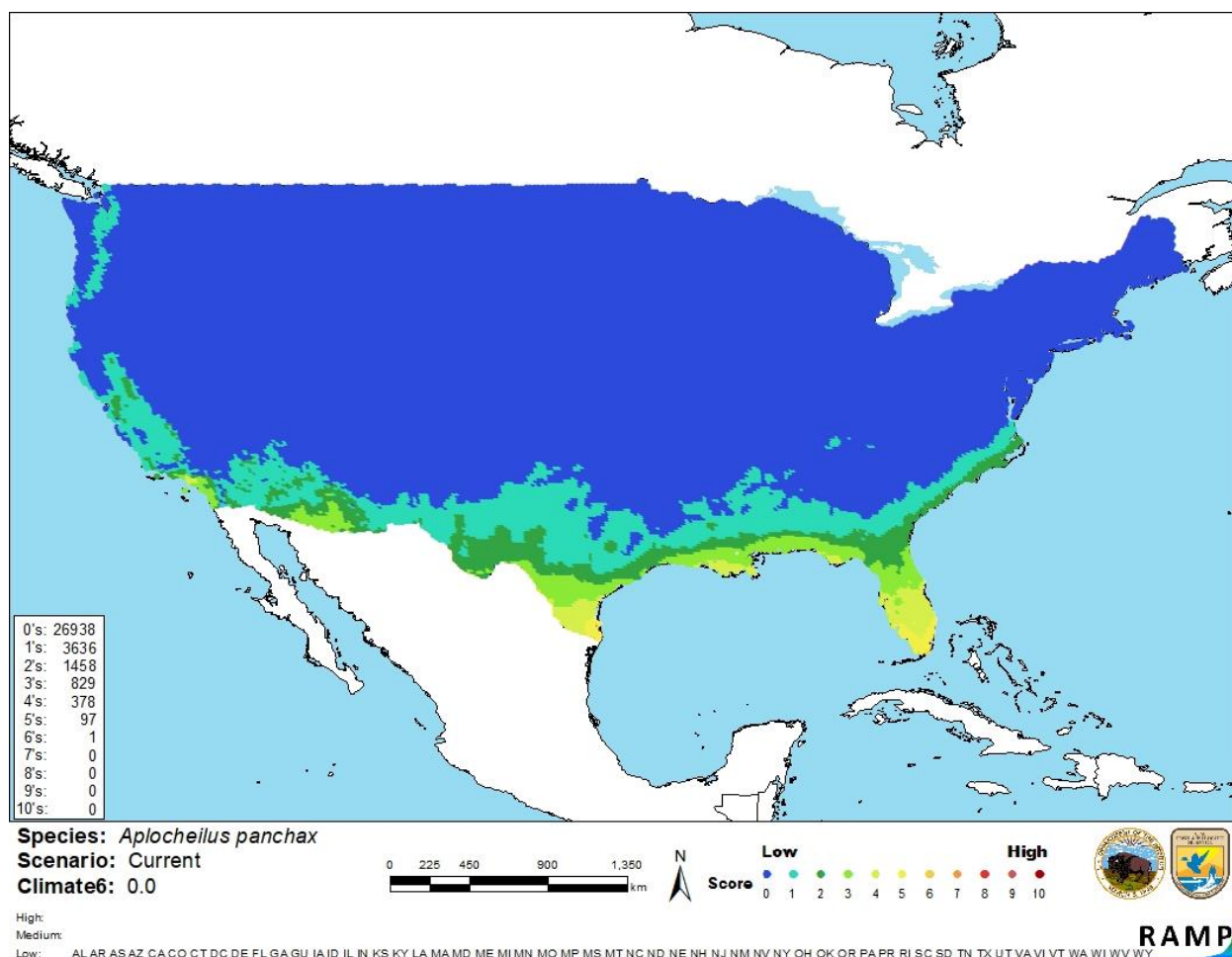


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Aplocheilus panchax* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). Counts of climate match scores are tabulated on the left. 0 = Lowest match, 10 = Highest match.

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 medium. *A. panchax* has a history of scientific study for over 70 years due to its use as a biological control agent for mosquitos. This species has purposefully been introduced outside of their native range. Limited information is available on potential impacts of introduction, but there was no scientifically defensible information on documented impacts of introduction.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Aplocheilus panchax, the Blue Panchax, is a tropical fish native to Southeast Asia. This species is native to Bangladesh, Cambodia, India, Malaysia, Myanmar, Nepal, Singapore, Thailand, and Vietnam. *A. panchax* is usually found in the lowland wetlands and spawns during the monsoon months. *A. panchax* has been purposely introduced to areas outside of their native range, Indonesia, Timor-Leste and the Philippines, due to their popularity in the aquarium trade and their use as a biological control agent for mosquitos. No information regarding negative impacts of introduction have been reported for *Aplocheilus panchax*. The history of invasiveness is none documented. The climate match for the contiguous United States is low, with all states having individually low climate scores. The certainty of assessment is medium. The overall risk assessment category for *Aplocheilus panchax* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Medium**
- **Remarks/Important additional information: No additional remarks**
- **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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