

# Striped Panchax (*Apllocheilus lineatus*)

## Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2011  
Revised, April 2019  
Web Version, 10/17/2019



Photo: J. Bukkems. Licensed under CC-BY-NC. Available:  
<https://www.fishbase.se/photos/UploadedBy.php?autoctr=17206&win=uploaded>. (April 2019).

## 1 Native Range and Status in the United States

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### Native Range

From Froese and Pauly (2019):

“Asia: Widely distributed in Peninsular India [Menon 1999]. Reported from Sri Lanka [Welcomme 1988].”

“Occurs in western (Coorg, Wayanad, Kerala) and south eastern regions. Found in Western Ghats [Shaji et al. 2000]. Widely distributed in Peninsular India [Menon 1999].”

From Chaudhry and Dahanukar (2011):

“It has been reported from Sri Lanka, but its presence there requires confirmation. The species is present in two disjunct populations in India. It has been lost from some parts of its range in southern India due to the introduction of *Gambusia* and *Poecilia* (Pune, Maharashtra; N. Dahanukar pers. comm.)”

## **Status in the United States**

From Froese and Pauly (2019):

“Introduced to Oahu [Maciolek 1984]. Not contained in 1992 list of introduced and established freshwater fishes of Hawaii.”

From Nico (2019):

“Failed in Hawaii.”

*Aplocheilus lineatus* is in trade in the United States.

From Arizona Aquatic Gardens (2019):

“Golden Wonder Killifish  
\$4.99”

“Striped Panchax, *Aplocheilus lineatus*, Golden Wonder Topminnow”

## **Means of Introductions in the United States**

From Nico (2019):

“Unknown. Maciolek (1984) is unclear as to whether this is one of the cyprinodonts imported by the Hawaii Department of Health and, if so, whether the species was intentionally stocked for mosquito control.”

## **Remarks**

From Chaudhry and Dahanukar (2011):

“The species is widespread and locally declining in parts of its range due to introduced species (for mosquito control). However, this decline is not thought to be at a rate to qualify the species for a threatened category or Near Threatened.”

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2019):

“**Current status:** Valid as *Aplocheilus lineatus* (Valenciennes 1846).”

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 lineatus* (Valenciennes in Cuvier and Valenciennes, 1846)”

### Size, Weight, and Age Range

From Froese and Pauly (2019):

“Max length : 10.0 cm TL male/unsexed; [Huber 1996]; common length : 7.0 cm male/unsexed; [Talwar and Jhingran 1991]”

### Environment

From Froese and Pauly (2019):

“Freshwater; brackish; benthopelagic; non-migratory. [...] 22°C - 25°C [Riehl and Baensch 1991; 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: Widely distributed in Peninsular India [Menon 1999]. Reported from Sri Lanka [Welcomme 1988].”

From Chaudhry and Dahanukar (2011):

“It has been reported from Sri Lanka, but its presence there requires confirmation. The species is present in two disjunct populations in India. It has been lost from some parts of its range in southern India due to the introduction of *Gambusia* and *Poecilia* (Pune, Maharashtra; N. Dahanukar pers. comm.).”

### **Introduced**

From Yeo and Lim (2010):

“In Singapore, *Aplocheilus lineatus* is presently known from two localities, both under the jurisdiction of the National Parks Board.”

“*Aplocheilus lineatus* is an established introduced species in Singapore, with two separate small populations that appear to be locally restricted to the Bukit Batok Nature Park and the Singapore Botanic Gardens.”

## **Means of Introduction Outside the United States**

From Yeo and Lim (2010):

“The source is likely to be the ornamental fish trade as this species is imported into Singapore for sale as aquarium pets.”

“This leaves us with the distinct possibility that *Aplocheilus lineatus* may have been intentionally released by members of the public into the stream either as an ornamental fish with the intention of improving the perceived aesthetics of the stream, or as a ‘mercy release’ to gain spiritual merit.”

## **Short Description**

From Yeo and Lim (2010):

“*Aplocheilus lineatus* (Valenciennes) belongs to the killifish family Aplocheilidae. This species is recognisable by its slender body with a rather straight dorsal profile, short-based dorsal fin, long-based anal fin, and oval-shaped caudal fin. Viewed dorsally, the mouth is broadly curved, and there is an iridescent white spot on top of the head between the rear edges of the eyes. The scales are large, 32 to 34 in longitudinal series. The pelvic fins have the second branched ray elongated into a filament that may stretch to the middle of the anal fin when pressed against the belly. Adult males are olive-brown on the dorsum. The flanks are paler with rows of metallic

greenish-gold and red spots which, on many individuals, are linked into stripes [...]. Females and juvenile males [...] are darker coloured with seven to 11 narrow black bars on the sides. The upper and lower margins of the caudal fin are red, or red and bluish-white [...].”

From Loiselle (2006):

“[...] *Aplocheilus lineatus* [...] possess one or two basal rows of small scales on the caudal fin that overlap the fin rays, [...].”

## **Biology**

From Chaudhry and Dahanukar (2011):

“This fish lives in streams and reservoirs at high altitudes, and in rivers, wells of the plains, low-lying paddy fields, swamps and brackish waters (Talwar and Jhingran 1991).”

From Jacob and Balakrishnan (1982):

“[...] *A. lineatus* is principally a surface feeding carnivore, [...]. Macrurans and dermapterans are not consumed by the small- sized fish, while cladocerans and copepods are not predated by the large-sized group. Collembolans, tadpoles, and rarely mecopterans and crustacean larvae, are eaten by the large-sized group. Again, occasional engulfment of tardigradans is only noted in the small-sized group, while dipterans are similarly ingested by the medium-sized group.”

From Yeo and Lim (2010):

“The eggs are deposited near the water’s surface among fine-leaved aquatic vegetation, and they hatch after 12 to 14 days (Lambert, 2001: 53; Sandford, 1995: 158; Schliwen, 2005: 206).”

## **Human Uses**

From Chaudhry and Dahanukar (2011):

“This is a small fish, it is not an important food fish. It has been used for mosquito control, and in the aquarium trade.”

## **Diseases**

**No OIE-reportable diseases (OIE 2019) were found to be associated with *Aplocheilus lineatus*.**

According to Poelen et al. (2014), *A. lineatus* is a host for the parasite *Petasiger variospinosus*.

## **Threat to Humans**

From Froese and Pauly (2019):

“Harmless”

### 3 Impacts of Introductions

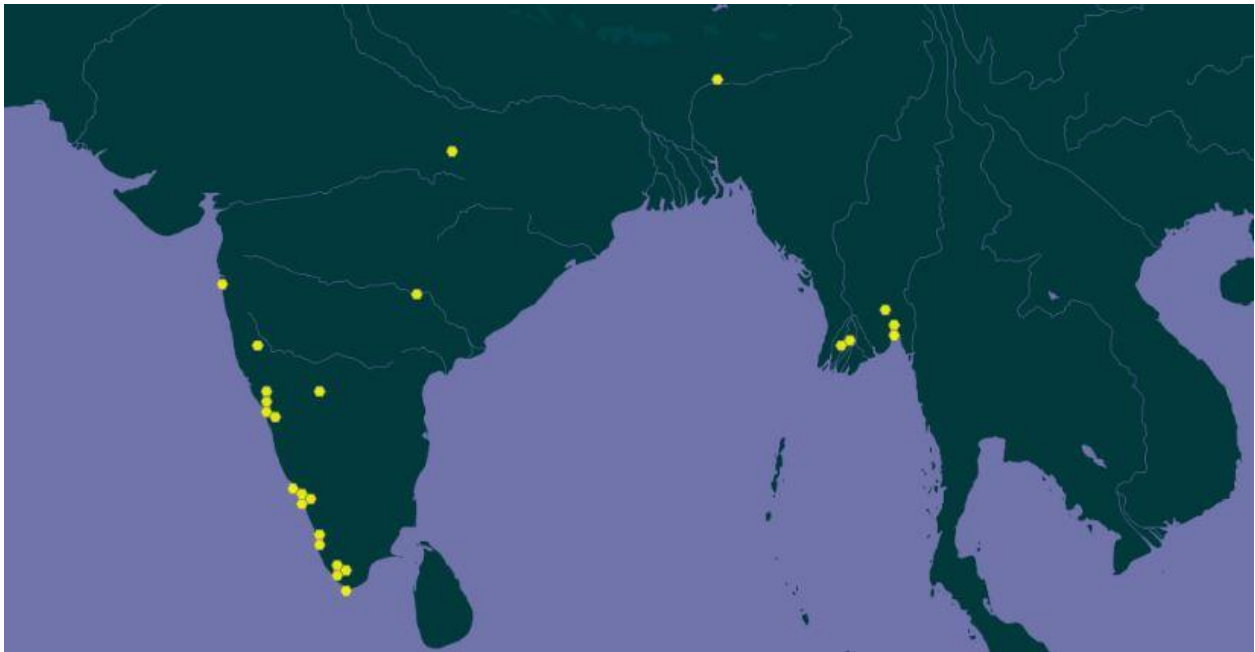
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From Nico (2019):

“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.”

### 4 Global Distribution

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**Figure 1.** Known global distribution of *Aplocheilus lineatus*. Locations are in India and Myanmar. Map from GBIF Secretariat (2019). Locations in Myanmar and northeastern India were not used to select source locations for the climate match. The number of records and number of individuals in the records suggest that there may be a population of *Aplocheilus lineatus* in Myanmar (GBIF Secretariat 2019), however, no confirmation of this could be found in peer-reviewed or grey literature. That combined with the geographic distance between known populations and those locations lead the assessor to exclude those locations from the climate match.

Froese and Pauly (2019) and Yeo and Lim (2010) report that *Aplocheilus lineatus* is established in Singapore. No georeferenced locations were available. However, Singapore is a small city-state and a source location could be selected to represent it in the climate match.

## 5 Distribution Within the United States

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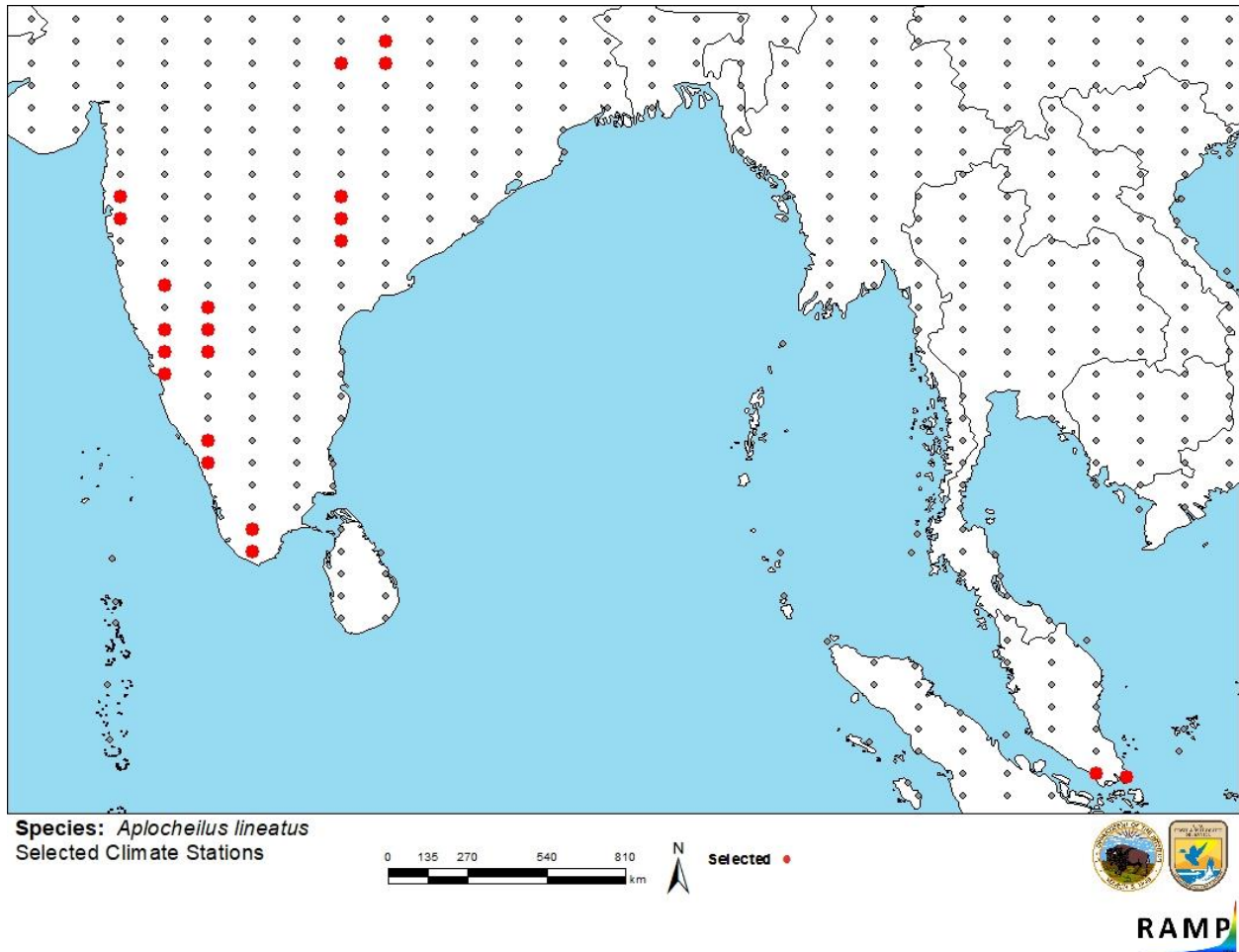


**Figure 2.** Known distribution of *Aplocheilus lineatus* in the United States. Locations are in Hawaii. Map from Nico (2019). The location in Hawaii was not used to select source locations for the climate amth. According to Nico (2019), this introduction did not result in an established population.

## 6 Climate Matching

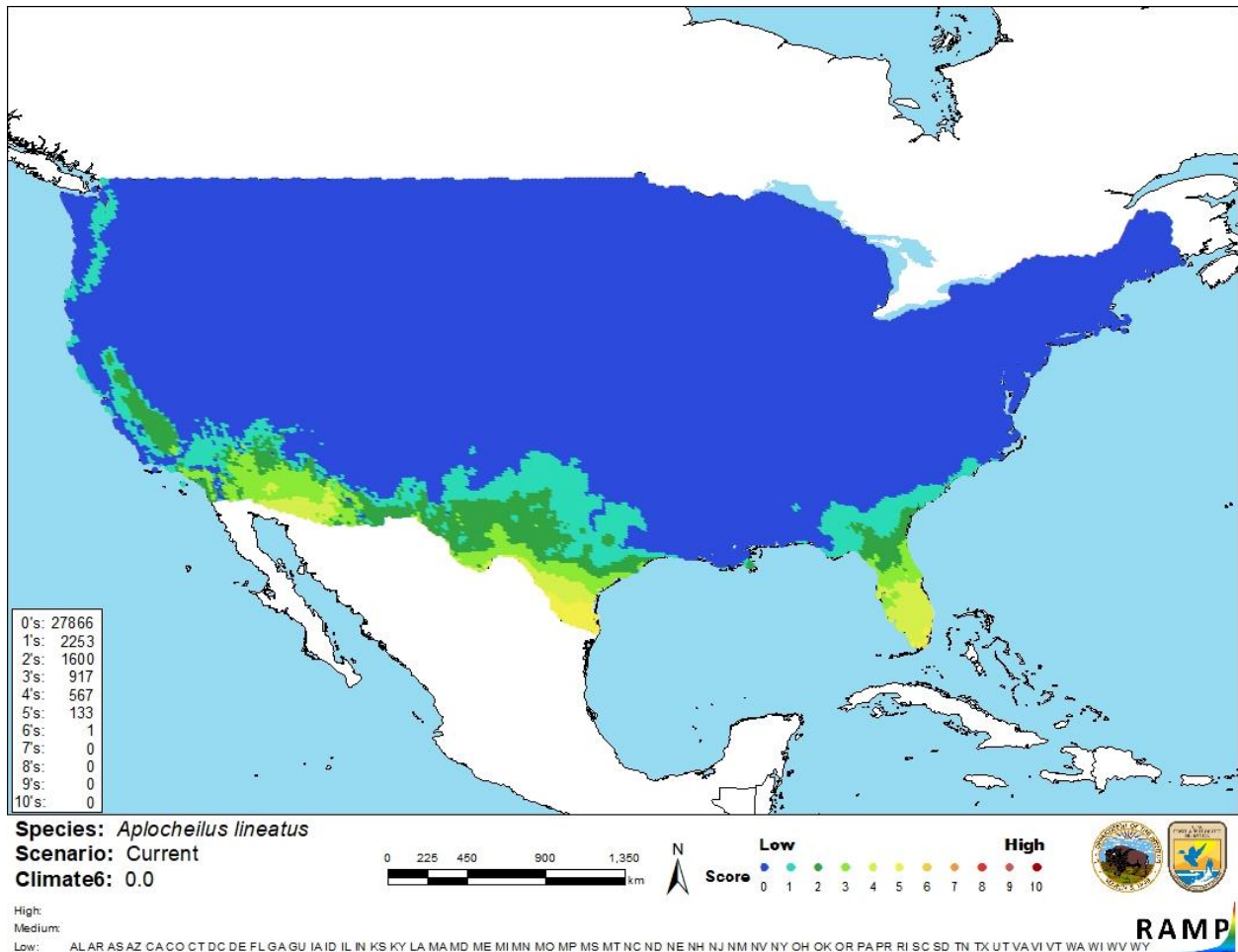
### Summary of Climate Matching Analysis

The climate match for the contiguous United States was generally low. Patches of medium match were found in southern parts of Arizona, Texas, and Florida. There were no areas of high match. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for 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 3.** RAMP (Sanders et al. 2018) source map showing weather stations in India and Bhutan selected as source locations (red) and non-source locations (gray) for *Aplocheilus lineatus* 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 *Aplocheilus lineatus* 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
$\geq 0.103$	High

## 7 Certainty of Assessment

The certainty of assessment is medium. Limited information is available on the history of invasiveness. *A. lineatus* has been reported as introduced but no information has been found to learn the impacts of their introduction. Information is available on the biology, environment and native range of the species.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

The Striped Panchax (*Aplocheilus lineatus*) is a freshwater, tropical killifish native to India and Sri Lanka. The population of this species has been declining due to introduced species into their native range for mosquito control. *Aplocheilus lineatus* is popular in the aquarium trade which is likely how this species has been introduced outside of their native range. *A. lineatus* is in trade in the United States. *A. lineatus* has been introduced and established in Singapore and introduced to Hawaii where it did not become established. No impacts of introduction have been reported. The climate match for the contiguous United States is low; all individual states received low climate scores. The certainty of assessment is medium. The overall risk assessment category for *Aplocheilus lineatus* 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 information**
- **Overall Risk Assessment Category: Uncertain**

## 9 References

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**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

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**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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