# Tricolor Sharkminnow (*Balantiocheilos melanopterus*)

## Ecological Risk Screening Summary

**U.S. Fish and Wildlife Service, January 2016**
**Revised, March 2018**
**Web Version, 8/29/2018**

Photo: Lerdsuwa. Licensed under Creative Commons (CC BY-SA 3.0). Available: https://en.wikipedia.org/wiki/Bala_shark#/media/File:Balantiocheilos_melanopterus.JPG. (March 2018).

# 1 Native Range and Status in the United States

## Native Range

From Neilson (2018):

"Native to the Mekong and Chao Phraya basins; Thailand, Laos, Vietnam, Sumatra, and Borneo (Kottelat 2001; Rainboth 1996)."

From Froese and Pauly (2018):

"Asia: Mekong and Chao Phraya basins, Malay Peninsula, Sumatra and Borneo."

From Eschmeyer et al. (2018):

"Distribution: Widespread in the Malay Peninsula, Sumatra and Borneo [now extinct in many areas]."

## Status in the United States

From Neilson (2018):

"A single specimen was captured in a gill net by Indiana Department of Natural Resources biologists in Diamond Lake, Indiana, in July 1995 (Seng and White 2003)."

"Status: Failed."

From Arizona Aquatic Gardens (2018):

"The bala shark [*Balantiocheilos melanopterus*] is actually an endangered species in it's [*sic*] native wild Borneo from overfishing and natural wildfires that destroyed flowing waters, but Bala Sharks remain very common and readily available in the aquarium trade from farm-raised stock here in the US."

Arizona Aquatic Gardens (2018) offers *B. melanopterus* for sale for $5.99.

## Means of Introductions in the United States

From Neilson (2018):

"Aquarium release."

## Remarks

From Neilson (2018):

"This species is considered endagered [sic] in its native range by the IUCN; populations across Southeast Asia have declined or become extirpated since 1975 through habitat alteration and overharvesting for the aquarium trade (Ng and Kottelat 2007)."

From Ng and Tan (1997):

"The bala shark was once abundant in Sumatra and Kalimantan, and was a classic Category I species. Despite its simple coloration, it became very popular all over the world as an aquarium fish about 20 years ago. This popularity resulted in severe overfishing which effectively exterminated the wild populations. The wild population in Sumatra was wiped out about 15 years ago, according to local fish dealers in Sumatra. It may well be extinct in other areas. The species

became so popular that it became one of the most important species in the trade. In addition to extensive and intensive collections in the various drainages where it was known to occur, the collectors apparently also discovered the breeding grounds. The bala shark, like many riverine cyprinids, apparently migrates to reach specific breeding grounds where it undergoes mass spawning (Roberts, 1989)."

"The species has had a `second chance' because fortunately, wild populations in Thailand were still intact. Although the wild populations in Thailand are dwindling, the species has been bred in captivity, with the stock derived mainly from captive Sumatran fish (pers. comm. with fish dealers). The success of captive breeding has meant that the trade in this species (which remains very popular) is today based almost entirely on cultured fish."

Eschmeyer et al. (2018) lists *Barbus melanopterus* as a synonym for *Balantiocheilos melanopterus*. This synonym was used, along with the valid scientific name, to search for information for this report.

Kottelat (1996) lists *Balantiocheilos melanopterus* as an endangered species on an assessment for The IUCN Red List of Threatened Species.

# 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 Ostariophysi
Order Cypriniformes
Superfamily Cyprinoidea
Family Cyprinidae
Genus *Balantiocheilos*
Species *Balantiocheilos melanopterus* (Bleeker, 1851)"

"Taxonomic Status: valid"

## Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 35.0 cm SL male/unsexed; [Baird et al. 1999]"

## Environment
From Froese and Pauly (2018):

"Freshwater; benthopelagic; pH range: 6.0 - 8.0; dH range: 5 – 12 […] 22°C - 28°C [Riehl and Baensch 1991; given the source, the reported temperature range is likely for aquarium settings]"

## Climate/Range
From Froese and Pauly (2018):

"Tropical; […] 20°N - 6°S"

## Distribution Outside the United States
### Native
From Neilson (2018):

"Native to the Mekong and Chao Phraya basins; Thailand, Laos, Vietnam, Sumatra, and Borneo (Kottelat 2001; Rainboth 1996)."

From Froese and Pauly (2018):

"Asia: Mekong and Chao Phraya basins, Malay Peninsula, Sumatra and Borneo."

From Eschmeyer et al. (2018):

"Distribution: Widespread in the Malay Peninsula, Sumatra and Borneo [now extinct in many areas]."

### Introduced
This species has not been reported as introduced outside of the United States.

## Means of Introduction Outside the United States
This species has not been reported as introduced outside of the United States.

## Short Description
From Froese and Pauly (2018):

"Silver body with black margins on dorsal, caudal, anal and pelvic; lower lip with a posterior groove forming a pocket opening backwards [Kottelat 2001]."

## Biology
From Froese and Pauly (2018):

"Found in midwater depths in large and medium-sized rivers and lakes. Feeds on phytoplankton, but mostly on small crustaceans, rotifers as well as insects and their larvae [Rainboth 1996]."

## Human Uses

From Froese and Pauly (2018):

"Aquaculture: commercial; aquarium: highly commercial"

## Diseases

From Froese and Pauly (2018):

"Fin-rot Disease (late stage), Bacterial diseases
Fin Rot (early stage), Bacterial diseases
Bacterial Infections (general), Bacterial diseases"

From Arizona Aquatic Gardens (2018):

"The bala shark [*Balantiocheilos melanopterus*] is actually an endangered species in it's [*sic*] native wild Borneo from overfishing and natural wildfires that destroyed flowing waters, but Bala Sharks remain very common and readily available in the aquarium trade from farm-raised stock here in the US."

Arizona Aquatic Gardens (2018) offers *B. melanopterus* for sale for $5.99.

## Threat to Humans

From Froese and Pauly (2018):

"Harmless"

# 3 Impacts of Introductions

No impacts of introductions were reported for this species.

# 4 Global Distribution

**Figure 1.** Known global distribution locations of *Balantiocheilos melanopterus*, reported from Malaysia and Indonesia. Map from GBIF Secretariat (2018).

# 5 Distribution Within the United States

**Figure 2.** Location of a failed introduction (orange diamond) of *Balantiocheilos melanopterus* in the State of Indiana, in the United States. Map from GBIF Secretariat (2018). This point was not included in the climate match analysis.

# 6 Climate Matching

## Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) for *Balantiocheilos melanopterus* within the contiguous United States is low overall. The Climate6 proportion for this species is 0.0. The range of proportions classified as low match is 0.000 to 0.005, inclusive. Locally, no states within the contiguous United States were reported above a low match.

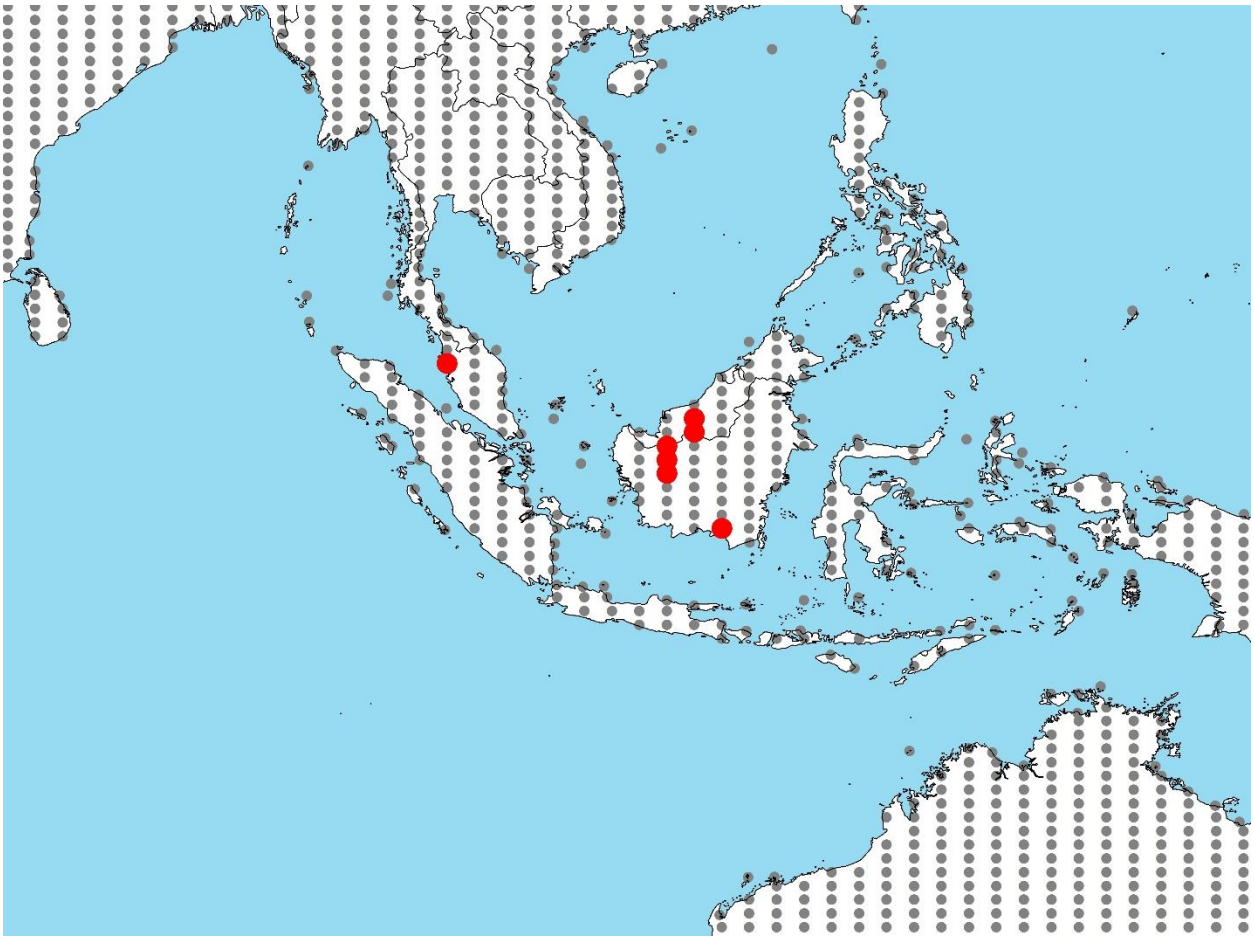

**Figure 3.** RAMP (Sanders et al. 2014) source map showing weather stations in Southeast Asia selected as source locations (red; Malaysia, Indonesia) and non-source locations (gray) for *Balantiocheilos melanopterus* climate matching. Source locations from GBIF Secretariat (2018).

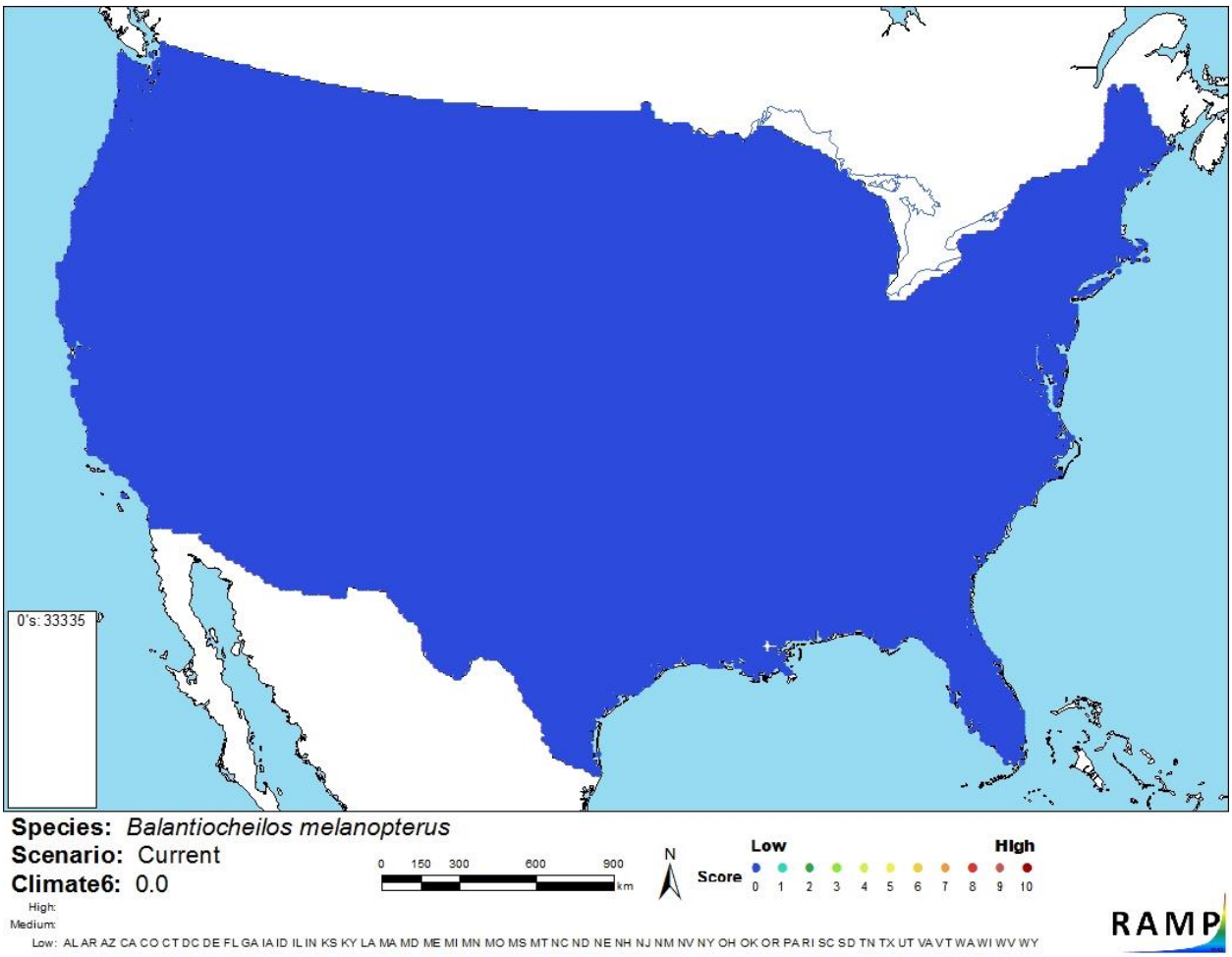


**Figure 4.** Map of RAMP (Sanders et al. 2014) climate matches for *Balantiocheilos melanopterus* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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

There is a fair amount of information available on the biology and distribution of *Balantiocheilos melanopterus.* Information on impacts of introduction is not available for review as the only reported introduction failed and no impacts were documented. A popular ornamental fish, *B. melanopterus* has been overfished to extinction in many of its native river basins. Given these factors, the certainty of assessment for this species is medium.

# 8 Risk Assessment

## Summary of Risk to the Contiguous United States

*Balantiocheilos melanopterus* is a tetra fish native to Mekong and Chao Phraya basins, Malay Peninsula, Sumatra and Borneo. A popular ornamental species, *B. melanopterus* is now endangered in its native range and is extinct in many of its native river basins, possibly due to overfishing for aquarium trade. Only one introduction beyond its native range has been reported, occurring in Diamond Lake, Indiana, in July 1995. The introduction failed and no impacts were reported. The species has been popular all over the world as an aquarium fish for over 20 years, with no evidence of establishment beyond its native range. This indicates a low history of invasiveness for *B. melanopterus*. Climate match within the contiguous United States is low overall, with no favorable climate conditions occurring locally either. Given the low history of invasiveness and low climate match, the overall risk for *Balantiocheilos melanopterus* is low within the contiguous United States.

## Assessment Elements

- **History of Invasiveness (Sec. 3): Low**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Medium**
- **Remarks/Important additional information: Reported endangered species.**
- **Overall Risk Assessment Category: Low**

# 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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Froese, R., and D. Pauly, editors. 2018. *Balantiocheilos melanopterus* (Bleeker, 1851). FishBase. Available: http://www.fishbase.org/summary/Balantiocheilos-melanopterus.html. (March 2018).

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Ng, P. K., and H. H. Tan. 1997. Freshwater fishes of Southeast Asia: potential for the aquarium fish trade and conservation issues. Aquarium Sciences and Conservation 1(2):79-90.

Sanders, S., C. Castiglione, and M. H. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.

# 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.**

Baird, I. G., V. Inthaphaisy, P. Kisouvannalath, B. Phylavanh, and B. Mounsouphom. 1999. The fishes of southern Lao. Lao Community Fisheries and Dolphin Protection Project. Ministry of Agriculture and Forestry, Lao PDR.

Kottelat, M. 2001. Fishes of Laos. Wildlife Heritage Trust Publications, Colombo, Sri Lanka.

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Seng, P., and G. White. 2003. Indiana aquatic nuisance species (ANS) management plan. Indiana Department of Natural Resources, Indianapolis, Indiana.