

White Cloud Mountain Fish (*Tanichthys albonubes*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, 2011
Revised, April 2019
Web Version, 9/22/2021

Organism Type: Fish
Overall Risk Assessment Category: Uncertain



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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

“Asia: China [Welcomme 1988] and Viet Nam [Kottelat 2001]. Thought to be extinct in the wild [Seidel 2012].”

From Cui (2011):

“The species has a disjunct distribution. The major range is close to the Tropic of Cancer north of Guangzhou City, and another population was recently discovered in coastal Guangdong at Shanwei in China (Yue and Chen 1998; Freyhof and Herder 2001; Kottelat 2001), and another wild population in Huizhou City in 2009, Hainan Island (Chan and Chen 2009) and it also had been found from a coastal stream draining into Halong Bay of Quang Ninh Province in Viet Nam (Chen *et al.* 1991; Kottelat 2001; Yi *et al.* 2004), but there was a probably extinct population in Hongkong and Shenzhen.”

Status in the United States

According to Fuller (2019), an observation was documented in Georgia in 2008. The status of this population is unknown.

From Froese and Pauly (2019):

“A popular aquarium fish, found in 85% of pet shops near Lakes Erie and Ontario [Rixon et al. 2005].”

From Rixon et al. (2005):

“The popularity of this fish is apparently high, as it was the ninth most abundant fish imported into the United States in October 1971 (Ramsey 1985).”

According to Chapman et al. (1997), *Tanichthys albonubes* represented 0.5% of the imported aquarium fish in 1992 (or just over 1,000,000 individuals).

Tanichthys albonubes is on Hawaii’s Conditional Animal List (Hawaii Department of Agriculture 2019).

Means of Introductions in the United States

From Fuller (2019):

“Aquarium release.”

Remarks

From Liang et al. (2008):

“It was believed to be extinct in the wild because there were no reports of this fish in the wild since 1980. In September 2003, a small and isolated population of the fish was discovered in a mountain puddle in the north vicinity of Guangzhou.”

From Rixon et al. (2005):

“Based on its ability to tolerate low temperatures, its invasion history, and high occurrence frequency, the probability of this fish invading the Great Lakes is high.”

From Cui (2011):

“The species is said [sic] very rare in the wild, possibly because of the small size it may be overlooked. It is believed the fish is extinct in Hong Kong, and it was reintroduced in Guangzhou.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Fricke et al. (2019):

“**Current status:** Valid as *Tanichthys albonubes* Lin 1932.”

From ITIS (2019):

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 *Tanichthys*
Species *Tanichthys albonubes* Lin, 1932

Size, Weight, and Age Range

From Froese and Pauly (2019):

“Max length : 4.0 cm TL male/unsexed; [Man and Hodgkiss 1981]; common length : 2.1 cm SL male/unsexed; [Nichols 1943]”

Environment

From Froese and Pauly (2019):

“Freshwater; demersal; pH range: 6.0 - 8.0; dH range: 5 - 19. [...]; 18°C - 22°C [Riehl and Baensch 1991; assumed to be recommended aquarium temperature];”

“Can survive in water temperature as low as 5°C.”

Climate

From Froese and Pauly (2019):

“Tropical; [...]; 24°N - 18°N, 104°E - 121°E [Chan and Chen 2009]”

Distribution Outside the United States

Native

From Froese and Pauly (2019):

“Asia: China [Welcomme 1988] and Viet Nam [Kottelat 2001].”

From Cui (2011):

“The species has a disjunct distribution. The major range is close to the Tropic of Cancer north of Guangzhou City, and another population was recently discovered in coastal Guangdong at Shanwei in China (Yue and Chen 1998; Freyhof and Herder 2001; Kottelat 2001), and another wild population in Huizhou City in 2009, Hainan Island (Chan and Chen 2009) and it also had been found from a coastal stream draining into Halong Bay of Quang Ninh Province in Viet Nam (Chen *et al.* 1991; Kottelat 2001; Yi *et al.* 2004), but there was a probably extinct population in Hongkong and Shenzhen.”

Introduced

From Rixon *et al.* (2005):

“*Tanichthys albonubes* (white cloud mountain minnow) [...] has established non-indigenous populations in Colombia (Welcomme 1988) and Madagascar (Stiassny and Raminosoa 1994).”

From Fricke *et al.* (2009):

“Distribution. Introduced in Réunion [Indian Ocean island department of France]”

From Lintermans (2004):

“One of the most recent aquarium species to establish [in Australia] is the white cloud mountain minnow (*Tanichthys albonubes*), [...] has recently established in streams on the central coast of NSW, and in suburban Brisbane (ASFB 2003c).”

From Froese and Pauly (2019):

“Established in the Magdalena watershed [Colombia] and in fish rearing facilities which has presumably escaped into local waters.”

Means of Introduction Outside the United States

From Froese and Pauly (2019):

“ornamental”

From Lintermans (2004):

“Whether this species has become established via the discarding of aquarium fish or escape from outside ponds where it was used for mosquito control is unknown [in Australia].”

Short Description

From Froese and Pauly (2019):

“Dorsal spines (total): 2 - 3; Dorsal soft rays (total): 6-7; Anal spines: 3; Anal soft rays: 7 - 9. Body green, with golden vertical zones on central axis of body and a number of dark lines above zones; dorsal and anal fins green and transparent edge; base of caudal fin with large red round spots. Snout blunt; lip thin and lower jaw a bit protruded; barbel absent; dorsal fin short and opposite anal fin, pectoral and pelvic fins small; pelvic scute absent [Wang 1998].”

From Liang et al. (2008):

“Identification: Small, compressed, elongate slender body, maximum 30 mm (Weitzman and Chan 1966). D iii/6, A iii/7–8, P i/9–11, V i/6, vertebrae 4+29, 30–32 lateral scales, gill rakers 8–10 (Zhen 1989; Chen 1998), mouth strongly oblique and protractile downward, lower jaw projecting and spatulate with soft round margin, smooth, thin lips, no barbels. No lateral line. Body green with golden horizontal lateral. Dorsal and anal fins green with transparent edges, large red rounded caudal spot (Lin 1932, 1935; Weitzman and Chan 1966).”

Biology

From Cui (2011):

“Inhabits clear, slow-moving brooks with thick weed growth. Feeds on plankton, meiobenthos and larvae of aquatic insects (Yi *et al.* 2004; Chen 2006). Spawns several times a year, from March to October, on plants (Chen *et al.* 2004).”

Human Uses

From Cui (2011):

“Found in the ornamental fish trade.”

From Froese and Pauly (2019):

“A popular aquarium fish, found in 85% of pet shops near Lakes Erie and Ontario [Rixon et al. 2005].”

From Rixon et al. (2005):

“The popularity of this fish is apparently high, as it was the ninth most abundant fish imported into the United States in October 1971 (Ramsey 1985).”

According to Chapman et al. (1997), *Tanichthys albonubes* represented 0.5% of the imported aquarium fish in 1992 (or just over 1,000,000 individuals).

Diseases

No OIE-reportable diseases (OIE 2021) were found to be associated with *T. albonubes*.

According to Froese and Pauly (2019), *Tanichthys albonubes* is susceptible to Fin-rot disease, bacterial diseases, Columnaris disease, Ichthyobodo infection and parasitic infections.

Threat to Humans

From Froese and Pauly (2019):

“Harmless”

3 Impacts of Introductions

From Fuller (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 History of Invasiveness

Tanichthys albonubes is a minnow species native to China and Vietnam, thought to be extinct from its native range. It is a popular aquarium fish and has been in trade in the United States since at least 1971. No information was available regarding the volume of trade. It has been documented in the wild in the State of Georgia, has been introduced into Colombia and Madagascar, and is established in Australia. Despite some knowledge of the species outside of its native range, the history of invasiveness is classified as Data Deficient.

5 Global Distribution



Figure 1. Known global distribution of *Tanichthys albonubes*. Map from GBIF Secretariat (2019).

Established, non-native populations have been reported from Colombia and Madagascar (Rixon et al. 2005; Froese and Pauly 2019) but no georeferenced observations were available in those areas. Due to the lack of georeferenced observations those areas were not represented in the climate match. It was reported as introduced to Réunion (Fricke et al. 2019) but it is not reported if this introduction resulted in an established population.

6 Distribution Within the United States

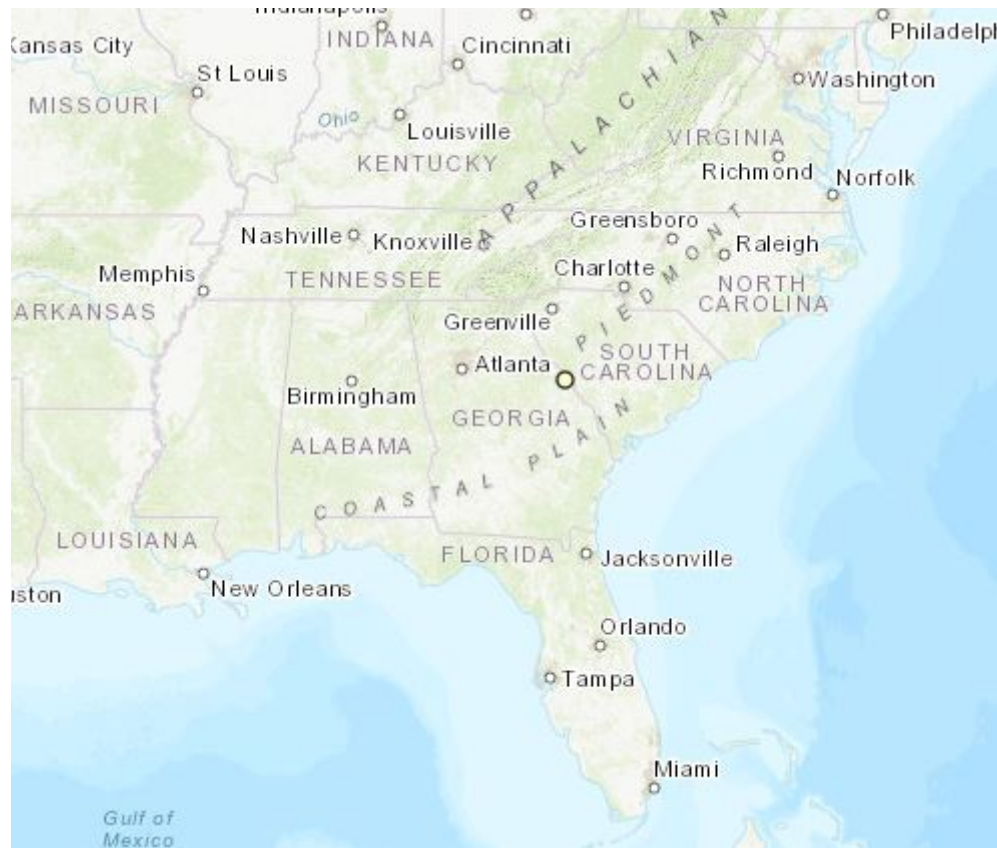


Figure 2. Known location of the single reprot of *Tanichthys albonubes* in the United States. Map from Fuller (2019). It is unknown if this location represents an established population and therefore, it was not used to select source points for the climate match.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for the contiguous United States was generally low for the northern and western states. Medium match was found in states along the Gulf of Mexico and up the Atlantic Coast. High match areas were only found in southern Texas and peninsular Florida. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for contiguous United States was 0.021, medium (scores between 0.005 and 0.103, exclusive, are considered medium). Both Florida and Texas received high individual Climate 6 scores, while Georgia received a medium individual score, and all other States received low individual scores.

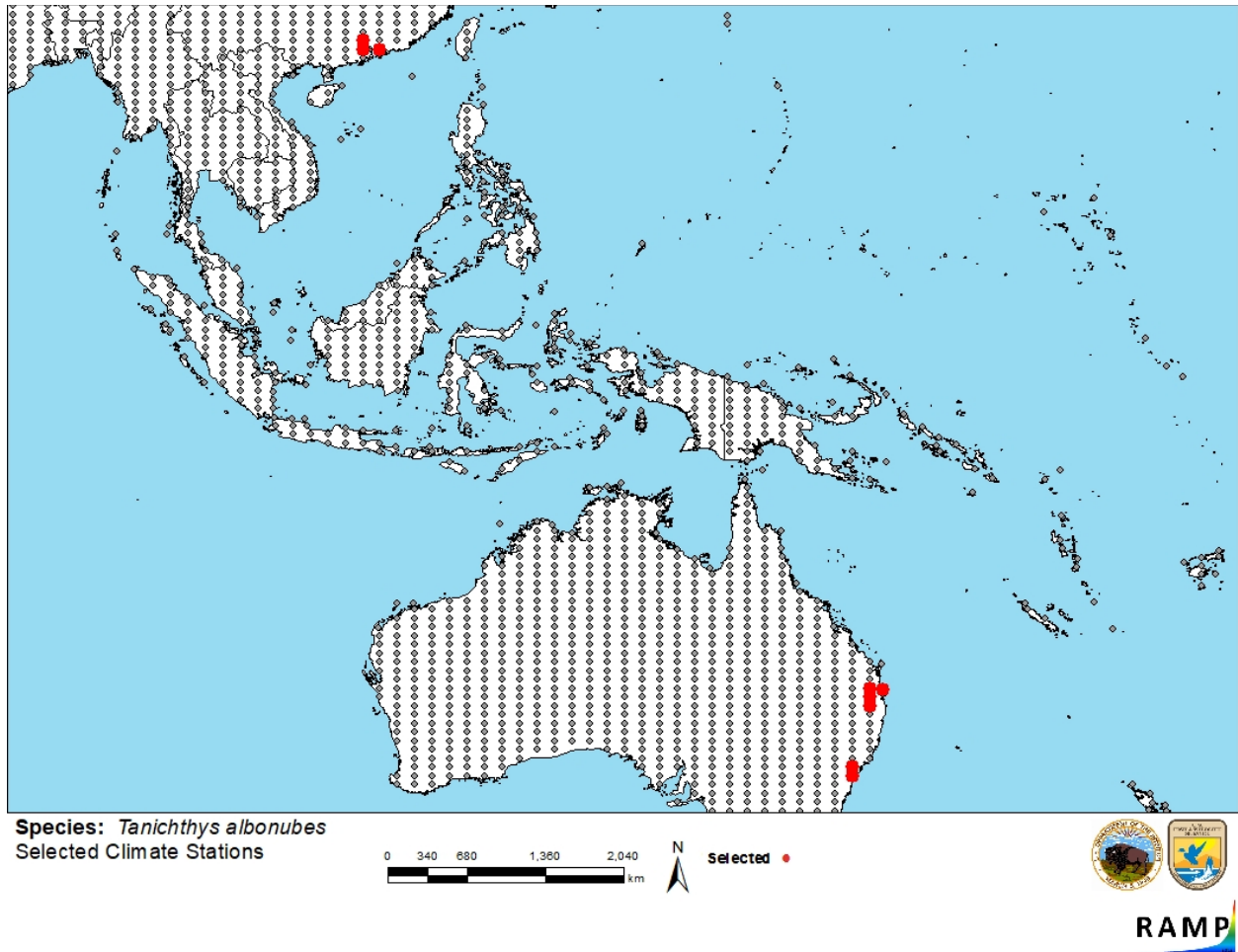


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in Asia and Oceania selected as source locations (red; China, Australia) and non-source locations (gray) for *Tanichthys albonubes* climate matching. Source locations from GBIF Secretariat (2019). Selected source locations are within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

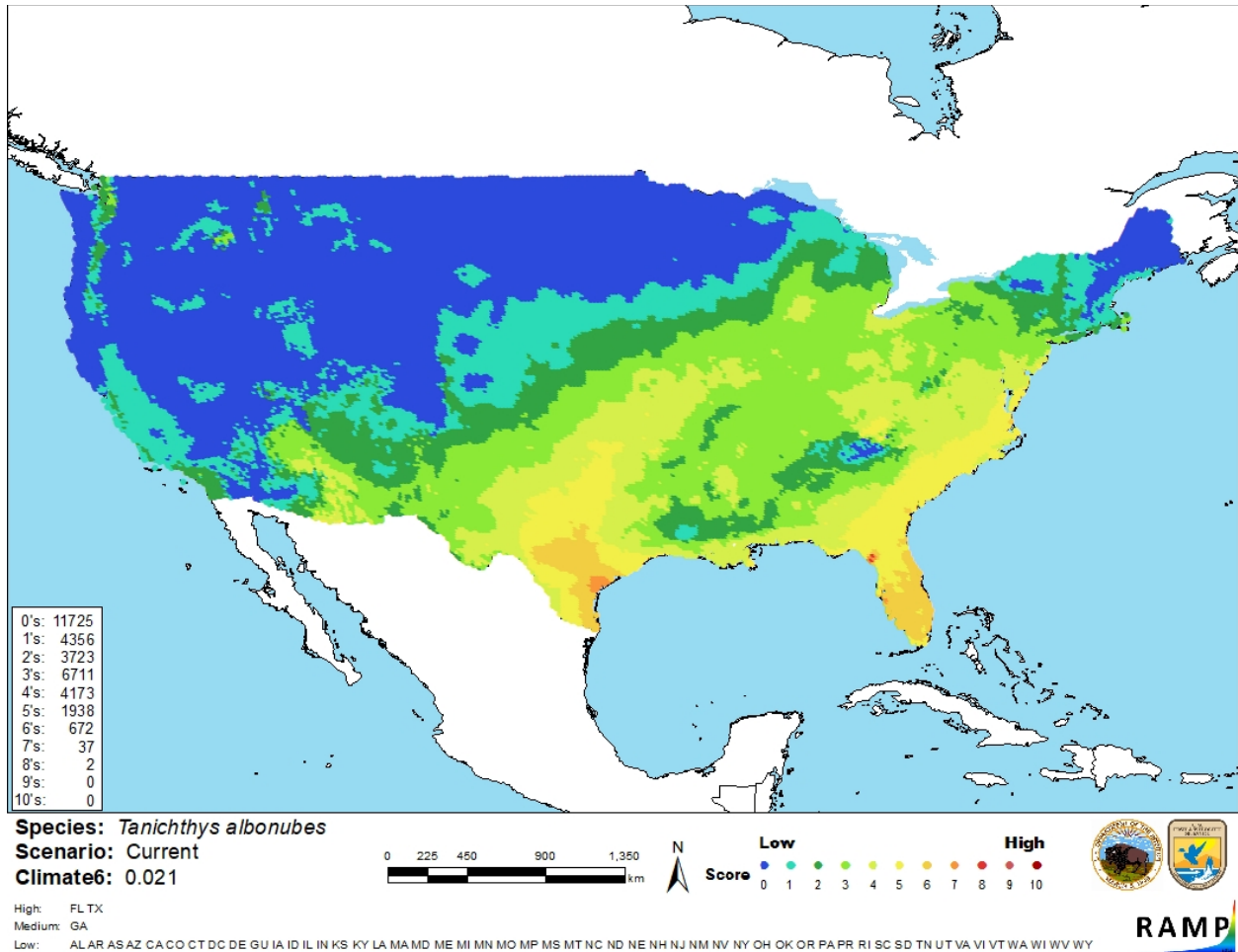


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Tanichthys albonubes* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

8 Certainty of Assessment

Certainty of assessment is low. *T. albonubes* has been reported as introduced and established outside of their native range. There is clear information available on the biology, environment, and distribution of this species in peer-reviewed research; however, no information has been

found on the impacts of introduction of this species. No georeferenced observations were available to represent part of the introduced range of the species in the climate match.

9 Risk Assessment

Summary of Risk to the Contiguous United States

The White Cloud Mountain Fish, *Tanichthys albonubes*, is a freshwater fish native to China and Vietnam. This species is considered rare in the wild. Captive bred fish have been reintroduced to their native range in hope to restore their population. *T. albonubes* is a highly commercialized aquarium fish and has been in trade in the United States since at least 1971. *T. albonubes* has been reported as introduced to Columbia, Australia, Reunion (Indian Ocean island department of France), Madagascar and the United States. This species has known established populations outside of their native range but no impacts of introduction have been reported in these locations. Therefore, the history of invasiveness is classified as Data Deficient. The overall climate match for the contiguous United States is medium. Areas of high match were found in Florida and southern Texas. Certainty of assessment is low due to a lack of information regarding history of invasiveness and part of the introduced range not represented in the climate match. The overall risk assessment category for *Tanichthys albonubes* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Data Deficient**
- **Overall Climate Match (Sec. 6): Medium**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information: No additional information.**
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

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11 Literature Cited in Quoted Material

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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