

# Freshwater Cobbler (*Tandanus bostocki*)

## Ecological Risk Screening Summary

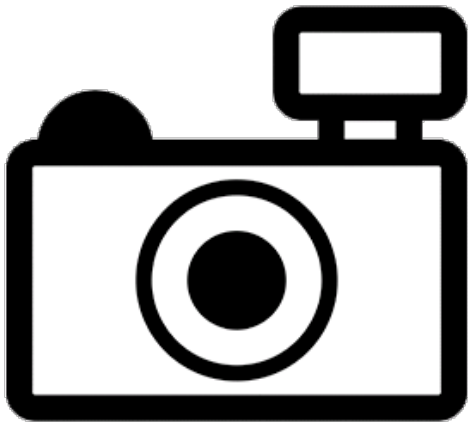
U.S. Fish & Wildlife Service, September 2015

Revised, April 2018

Web Version, 9/21/2021

Organism Type: Fish

Overall Risk Assessment Category: Uncertain



No Photo Available

## 1 Native Range and Status in the United States

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### Native Range

From Froese and Pauly (2018):

“Oceania: endemic to Australia.”

From Gomon and Bray (2016):

“Endemic to temperate waters of southwestern Western Australia, from Frankland River (35°S) to Moore River (31°25’S).”

### Status in the United States

No records of *Tandanus bostocki* in trade or in the wild in the United States were found.

All species in family Plotosidae are listed on Hawaii's Prohibited Animal List (Hawaii Department of Agriculture 2019).

## Means of Introductions in the United States

*Tandanus bostocki* has not been reported in the wild in the United States.

## Remarks

No additional remarks.

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From Eschmeyer et al. (2018):

“Current status: Valid as *Tandanus bostocki* Whitley 1944.”

From ITIS (2018):

Kingdom Animalia  
Subkingdom Bilateria  
Infrakingdom Deuterostomia  
Phylum Chordata  
Subphylum Vertebrata  
Infraphylum Gnathostomata  
Superclass Actinopterygii  
Class Teleostei  
Superorder Ostariophysi  
Order Siluriformes  
Family Plotosidae  
Genus *Tandanus*  
Species *Tandanus bostocki* Whitley, 1944

### Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 50.0 cm TL male/unsexed; [Axelrod et al. 1991]; common length : 25.0 cm TL male/unsexed; [Allen 1989]”

### Environment

From Froese and Pauly (2018):

“Freshwater; demersal. [...]; ? - 25°C [assumed to be recommended aquarium temperature] [Baensch and Riehl 1997]”

From Gomon and Bray (2011):

“Although usually found in freshwater, this species is tolerant of brackish conditions. [...] Individuals swim close to rocky, sand or gravel bottoms and may shelter in river bank holes and amongst the submerged root mounds of sedge tussocks.”

From Morgan et al. (2003):

“*Tandanus bostocki* was found only in conductivities <8.3 mS cm<sup>-1</sup> in the lower main channel and major tributaries of the river [...]”

## **Climate**

From Froese and Pauly (2018):

“Temperate”

## **Distribution Outside the United States**

Native

From Froese and Pauly (2018):

“Oceania: endemic to Australia.”

From Gomon and Bray (2016):

“Endemic to temperate waters of southwestern Western Australia, from Frankland River (35°S) to Moore River (31°25’S).”

Introduced

No records of introductions of *Tandanus bostocki* were found.

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

No records of introductions of *Tandanus bostocki* were found.

## **Short Description**

From Gomon and Bray (2016):

“First Dorsal-fin rays: I, 6 or fewer. 2nd Dorsal + caudal + anal fin rays: 150. Gill rakers: 16-21. Body elongate, slender, laterally compressed and tapering posteriorly; tail pointed; head broad and flattened; four pairs of barbels around the mouth, 2 pairs below the upper lip and 2 pairs above; lateral line present.”

“Scales absent, body covered in smooth skin. First dorsal fin small, moderately elevated with a sharp spine and 6 or fewer soft rays; 2nd dorsal and anal fins confluent with caudal fin,

originating on middle of back; caudodorsal fin base about 50% SL; pectoral fin with sharp spine on outer edge.”

“Brown to tan (darker on head and back) with distinctive mottling on head, body and fins.”

## Biology

From Froese and Pauly (2018):

“Lives in slow-flowing streams, ponds and reservoirs. Occurs in isolated pools in riverbeds and some freshwater lakes, swimming close to rocky, gravelly or sandy bottoms. Underwater cavities in river banks and root mounds of sedge tussocks may be utilized for shelter. Tolerant of brackish conditions [Allen et al. 2002]. Benthic [Hoesel et al. 2006].”

From Gomon and Bray (2016):

“Carnivore - feeds mostly on freshwater crayfish, shrimps and small fishes.”

“Spawning occurs during spring and summer, and individuals migrate upstream to spawn. Males makes a nest of gravel and rocks with a central sandy depression into which females deposit spherical and non-adhesive eggs that hatch in around 7 days. Individuals may live for up to 10 years.”

“Undertakes mass upstream migrations at night to feed and for spawning, returning to shelter under the same logs during the day.”

From Klunzinger et al. (2010):

“Small, white, bladder-like cysts were observed macroscopically on *Tandanus bostocki* Whitley, 1944 (freshwater cobbler) captured from the Blackwood River, Western Australia. Light microscopy of sectioned cysts revealed that they contained glochidia and these were of similar size and shape to glochidia obtained from gravid females of *W. carteri*.”

From Morgan and Beatty (2006):

“Breeding occurs in late spring and early summer and the diet is dominated by freshwater crayfish, mussels and small teleosts.”

From Beatty et al. (2010):

“We determined the significance of nonsaline groundwater intrusion in maintaining habitat and migratory routes of the freshwater cobbler, *Tandanus bostocki* during prolonged annual dry periods; characteristic of Mediterranean climatic zones. *Tandanus bostocki* undertook large, yet spatially and temporally variable, localised movements through riffles. During baseflow, the period of major groundwater influence, movements were significantly associated with discharge. Analysis of gonadal development suggested that such movements were not strictly related to reproduction and were probably for foraging purposes. The study reveals groundwater is crucial

in maintaining migratory routes through riffles and suggests *T. bostocki* may be reliably used as an indicator of aquatic habitat connectivity in light of groundwater extractions and also continued rainfall reductions in this region due to climate change.”

## **Human Uses**

No records of human uses of *Tandanus bostocki* were found.

## **Diseases**

**No records of OIE-reportable diseases (OIE 2021) were found for *Tandanus bostocki*.**

Poelen et al. (2014) lists *Pseudocapillaria* as a parasite of *Tandanus bostocki*.

## **Threat to Humans**

From Froese and Pauly (2018):

“Venomous”

From Gomon and Bray (2016):

“The dorsal and pectoral fins are armed with venomous spines that may inflict a very painful sting.”

## **3 Impacts of Introductions**

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No records of introductions of *Tandanus bostocki* were found.

## **4 History of Invasiveness**

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No records of introductions of *Tandanus bostocki* were found, so the history of invasiveness is classified as No Known Nonnative Population.

## 5 Global Distribution

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**Figure 1.** Known global distribution of *Tandanus bostocki*. Locations are in Australia. Map from GBIF Secretariat (2018).

## 6 Distribution Within the United States

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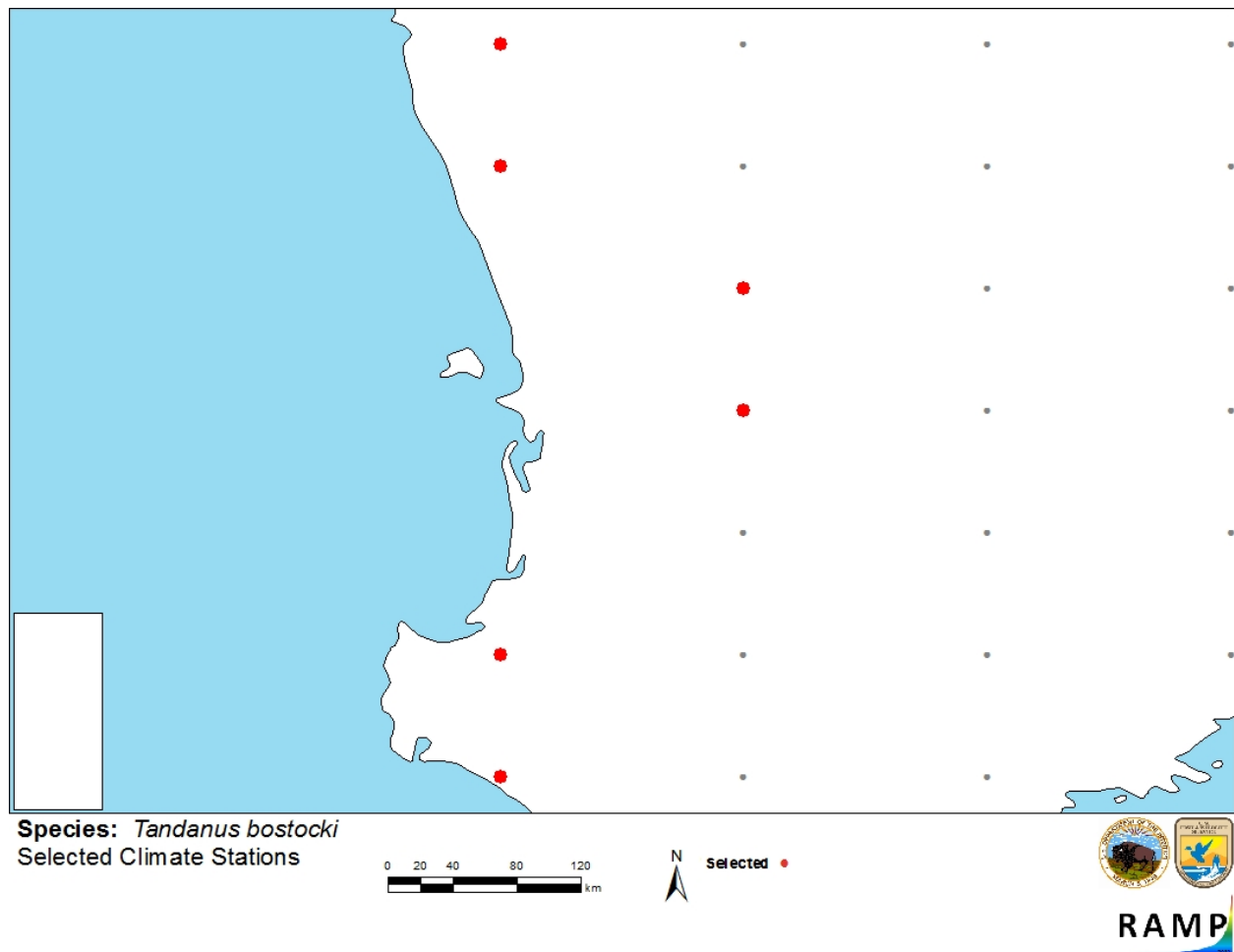
*Tandanus bostocki* has not been reported in the United States.

## 7 Climate Matching

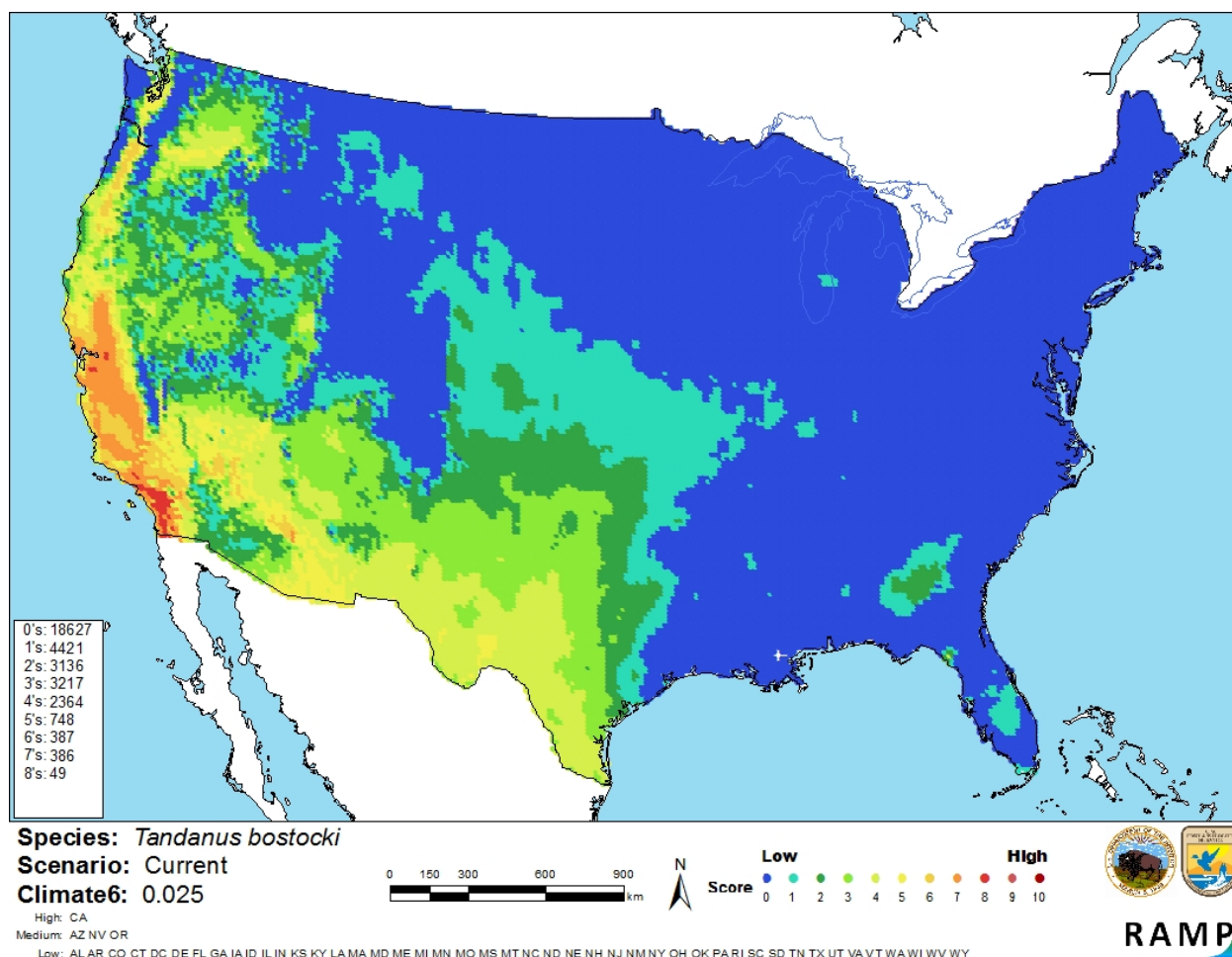
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### Summary of Climate Matching Analysis

The climate match for *Tandanus bostocki* was high in west coast specifically California. Other areas of the west coast had medium match. There were also areas of medium match in the southwest, including into southern Texas. The northeast, southeast, and Midwest had a low climate match. The overall Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous United States was 0.025, medium (scores between 0.005 and 0.103, exclusive, are considered medium). California had a high individual Climate 6 score. Arizona, Nevada, and Oregon had medium individual scores. All other States had low individual scores.



**Figure 2.** RAMP (Sanders et al. 2014) source map showing weather stations in southwest Australia selected as source locations (red) and non-source locations (gray) for *Tandanus bostocki* climate matching. Source locations from GBIF Secretariat (2018). 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. 2014) climate matches for *Tandanus bostocki* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). 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
$\geq 0.103$	High

## 8 Certainty of Assessment

The certainty of this assessment is low. There was adequate biological and ecological information available about *Tandanus bostocki*. No records of introductions into the wild were found. No information on trade was found.



## 9 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Tandanus bostocki* is an eeltail catfish native to southwest Australia. It inhabits slow flowing waters in Western Australia. The fin spines are venomous and may cause painful stings. No evidence of this species in trade or other human uses was found. The history of invasiveness is classified as No Known Nonnative Population. There were no records of *T. bostocki* introduced into the wild. The overall climate match was medium. Most of the contiguous United States had a low match but there were areas of high match in California. The certainty of this assessment is low due to a lack of information regarding history of invasiveness. The overall risk assessment category for *Tandanus bostocki* is uncertain.

### Assessment Elements

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

## 10 Literature Cited

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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 11.**

Beatty SJ, Morgan DL, McAleer FJ, Ramsay AR. 2010. Groundwater contribution to baseflow maintains habitat connectivity for *Tandanus bostocki* (Teleostei: Plotosidae) in southwestern Australian river. *Ecology of Freshwater Fish* 19:595–608.

Eschmeyer WN, Fricke R, van der Laan R, editors. 2018. Catalog of fishes: genera, species, references. California Academy of Science. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp> (April 2018).

Froese R, Pauly D, editors. 2018. *Tandanus bostocki* Whitley, 1944. FishBase. Available: <http://www.fishbase.se/summary/Tandanus-bostocki.html> (April 2018).

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Hawaii Department of Agriculture. 2019. Amendment and compilation of chapter 4-71, Hawaii Administrative Rules. Honolulu: Hawaii Department of Agriculture, Plant Industry Division. Available: <http://hdoa.hawaii.gov/pi/pq/import-program/pq-non-domestic-animal-and-microorganism-lists/> (February 2021).

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Klunzinger MW, Beatty SJ, Morgan DL, Lymbery R, Thomson GJ, Lymbery AJ. 2010. Discovery of a host fish species for glochidia of *Westralunio carteri* Iredale, 1934 (Bivalvia: Unionoida: Hyriidae). Journal of the Royal Society of Western Australia 94:19–23.

Morgan D, Beatty S. 2006. Fish fauna of the Donnelly River, Western Australia. Murdoch University. Report to the Southern Forests Landcare.

Morgan DL, Thornburn DC, Gill HS. 2003. Salinization of southwestern Western Australian rivers and the implications for the inland fish fauna – the Blackwood River, a case study. Pacific Conservation Biology 9:161–171.

[OIE] World Organisation for Animal Health. 2021. Animal diseases. Available: <https://www.oie.int/en/what-we-do/animal-health-and-welfare/animal-diseases/> (September 2021).

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Sanders S, Castiglione C, Hoff M. 2014. Risk Assessment Mapping Program: RAMP. Version 2.81. U.S. Fish and Wildlife Service.

## 11 Literature Cited in Quoted Material

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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.**

Allen GR. 1989. Freshwater fishes of Australia. Neptune City, New Jersey: T.F.H. Publications.

Allen GR, Midgley H, Allen M. 2002. Field guide to the freshwater fishes of Australia. [Source material did not give full citation for this reference.]

Axelrod HR, Burgess WE, Pronek N, Walls JG. 1991. Dr. Axelrod's atlas of freshwater aquarium fishes. 6th edition. Neptune City, New Jersey: T.F.H. Publications.

Baensch HA, Riehl R. 1985. Aquarien atlas, volume 2. Melle, Germany: Mergus, Verlag für Natur-und Heimtierkunde GmbH.

Hoese DF, Bray DJ, Paxton JR, Allen GR. 2006. Fishes. In Beasley OL, Wells A, editors. Zoological catalogue of Australia. [Source material did not give full citation for this reference.]