Clown Knifefish (*Chitala chitala*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, April 2011
Revised, February 2019
Web Version, 10/18/2019

Photo: Michal Klajban. Licensed under CC BY-SA 3.0. Available: https://commons.wikimedia.org/wiki/File:Ostravsk%C3%A1_ZOO,_chitala_chitala_(5).JPG. (February 2019).

1 Native Range and Status in the United States

Native Range

Froese and Pauly (2019):

"Asia: Indus, Ganges-Brahmaputra and Mahanadi river basins in India. No valid records from Irrawaddy, Salween or other river basins of Myanmar. Reports of *Chitala chitala* from Thailand and Indo-China were based on *Chitala ornata* and those from Malaysia and Indonesia on *Chitala lopis*."

From Chaudhry (2010):

"Extant (resident)
Bangladesh; India (Uttar Pradesh, Bihar, West Bengal, Tripura, Uttaranchal, Manipur, Assam); Nepal; Pakistan"

"Presence Uncertain
Cambodia; Indonesia; Malaysia; Myanmar"

Status in the United States

No wild or established populations of *Chitala chitala* have been recorded in the United States. No records of trade in *C. chitala* in the United States were found.

Means of Introductions in the United States

No wild or established populations of *Chitala chitala* have been recorded in the United States.

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2019), *Chitala chitala* (Hamilton 1822) is the current valid name for this species. It was originally described as *Mystus chitala* (Hamilton 1822) and has been known previously as *Notopterus chitala* (Hamilton 1822).

From ITIS (2019):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Osteoglossomorpha
Order Osteoglossiformes
Suborder Notopteroidei
Superfamily Notopteroidea
Family Notopteridae
Genus *Chitala*
Species *Chitala chitala* (Hamilton, 1822)"

Size, Weight, and Age Range

From Froese and Pauly (2019):

"Maturity: L_m 75.5 range ? - 91 cm
Max length : 122 cm SL male/unsexed; [Talwar and Jhingran 1991]; common length : 75.0 cm SL male/unsexed; [Davidson 1975]"

Environment

From Froese and Pauly (2019):

"Freshwater; demersal; pH range: 6.0 - 8.0; dH range: 5 - 19. […]; 24°C - 28°C [Baensch and Riehl 1985; assumed to be the recommended aquarium temperature]"

Climate/Range

From Froese and Pauly (2019):

"Tropical"

Distribution Outside the United States

Native

Froese and Pauly (2019):

"Asia: Indus, Ganges-Brahmaputra and Mahanadi river basins in India. No valid records from Irrawaddy, Salween or other river basins of Myanmar. Reports of *Chitala chitala* from Thailand and Indo-China were based on *Chitala ornata* and those from Malaysia and Indonesia on *Chitala lopis*."

From Chaudhry (2010):

"Extant (resident)
Bangladesh; India (Uttar Pradesh, Bihar, West Bengal, Tripura, Uttaranchal, Manipur, Assam); Nepal; Pakistan"

"Presence Uncertain
Cambodia; Indonesia; Malaysia; Myanmar"

Introduced

Froese and Pauly (2019) have listed *Chitala chitala* as introduced to Sri Lanka, the Philippines, Myanmar, and China.

Bambaradeniya (2002) reports that *C. chitala* is established in Sri Lanka.

Means of Introduction Outside the United States

According to Froese and Pauly (2019) the means of introduction of *Chitala chitala* outside of the United States is ornamental or aquaculture.

From Bambaradeniya (2002):

"Negligence [mode]; aquarists [source]; ornamental fish trade [purpose]"

Short Description

From Froese and Pauly (2019):

"Dorsal spines (total): 0; Dorsal soft rays (total): 9; Anal spines: 0; Anal soft rays: 117 - 127. The only species in which subadults and adults have a series of transverse gold or silver bars on the dorsum, but this color feature is not always present [Roberts 1992]. Differs from *C. ornata* in never having ocellated spots and from *C. blanci* and *C. lopis* in never having a black spot on the pectoral fin base [Roberts 1992]."

Biology

From Froese and Pauly (2019):

"Adults inhabit freshwater rivers, lakes, beels [lake-like wetland with still water], nullahs [intermittent stream] in the plains [Menon 1999], reservoirs, canals and ponds [Rahman 1989]. Feed on aquatic insects, mollusks, shrimps and small fishes [Rahman 1989]. Females lay eggs usually on stake or stump of wood, males fan them with tail, keep them aerated and silt-free, guard them against small catfish and other predators; complete give-away to fishermen; females not observed at egg posts; moderately important food fish [Davidson 1975]. Spawn once a year during May to August [Ukkatawewat 2005]."

"The male tends the clutch [Baensch and Riehl 1985]."

From Bambaradeniya (2002):

"The Clown-knife Fish (*Chitala chitala*) is a large voracious carnivore which feeds on slow-moving native fish."

Human Uses

From Froese and Pauly (2019):

"Fisheries: minor commercial; aquaculture: commercial; gamefish: yes; aquarium: commercial"

Diseases

No OIE reportable diseases (OIE 2019) were found for *Chitala chitala*.

According to Poelen et al. (2014) *Chitala chitala* is host to *Malayanodiscoides indicus, Notopterodiscoides, Thaparocleidus platamauxili,* and *Thaparocleidus tasekensis*.

Threat to Humans

From Froese and Pauly (2019):

"Harmless"

3 Impacts of Introductions

From Bambaradeniya (2002):

"Among the alien invasive fish in Sri Lanka, five species ([…] *Chitala chitala,* […]) are active predators of native aquatic fauna."

"The Clown-knife Fish (*Chitala chitala*) is a large voraceous [*sic*] carnivore which feeds on slow-moving native fish. As it multiplies and spreads rapidly in streams, rivers, ponds and marshes of the wet zone, it might have already affected the populations of the endemic fish which are mainly distributed in this zone."

4 Global Distribution

Figure 1. Known global distribution of *Chitala chitala*. Locations in Bangladesh, Cambodia, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, and Thailand. Map from GBIF Secretariat (2019). The point located in the ocean west of India was not used in the climate match since this is a freshwater fish and no records can verify *C. chitala* at that position. Locations in Cambodia, Indonesia, Malaysia, Myanmar, Thailand and Viet Nam are not considered to be valid source locations and will not be used in the climate match. According to Froese and Pauly (2019), these locations represent misidentification of specimen in the same family as *C. chitala*.

While Bambaradeniya (2002) reports the establishment of *C. chitala* in Sri Lanka, no georeferenced observations were found for that country.

5 Distribution Within the United States

No wild or established populations of *Chitala chitala* have been recorded in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Chitala chitala* was low for a majority of the contiguous United States. There were some patches of medium match along the southern border from Texas to California and in southeast Florida, but no there were 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 a low individual Climate 6 score.

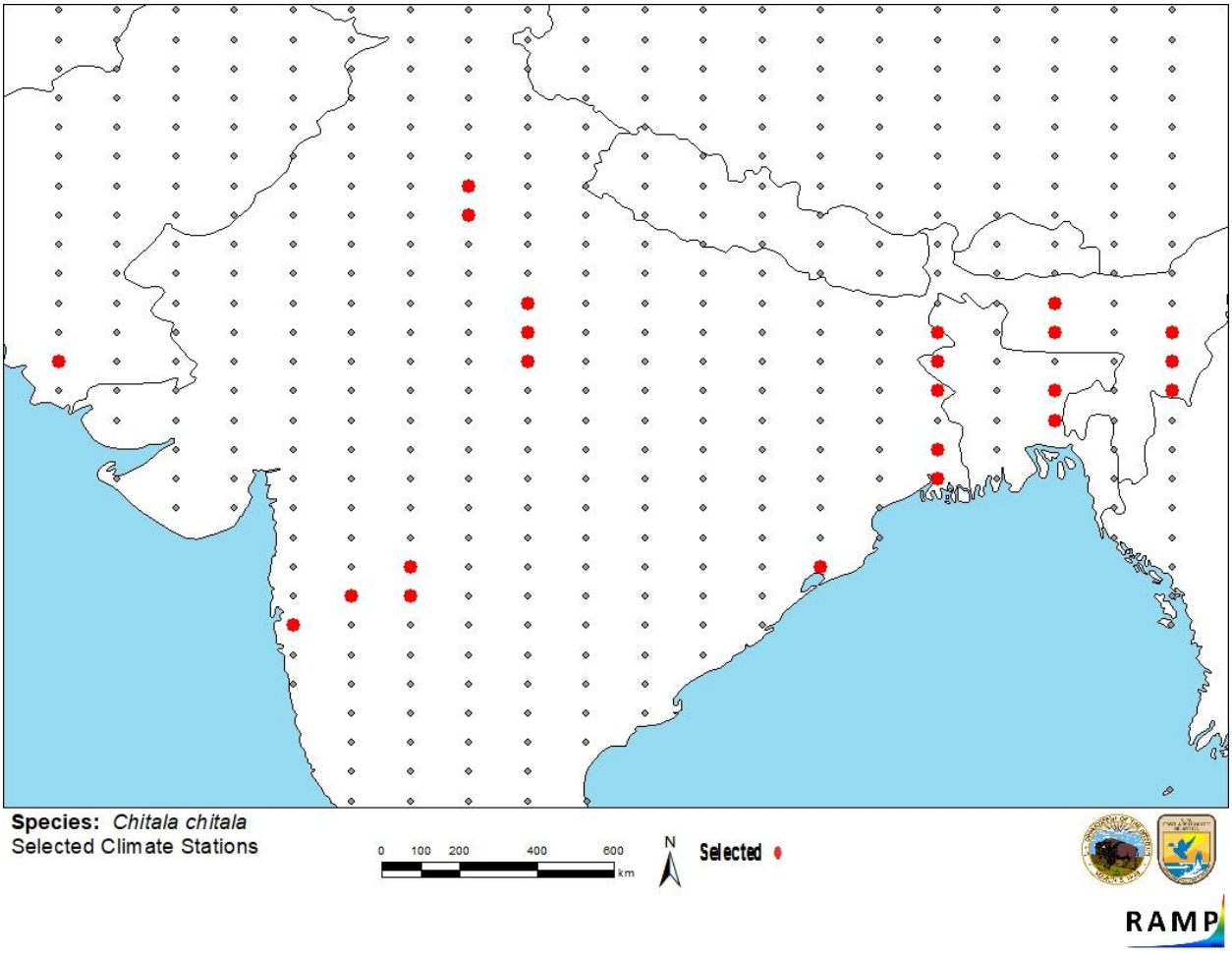

Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in Bangladesh, India, Nepal, and Pakistan selected as source locations (red) and non-source locations (gray) for *Chitala chitala* climate matching. Source locations from GBIF Secretariat (2019). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

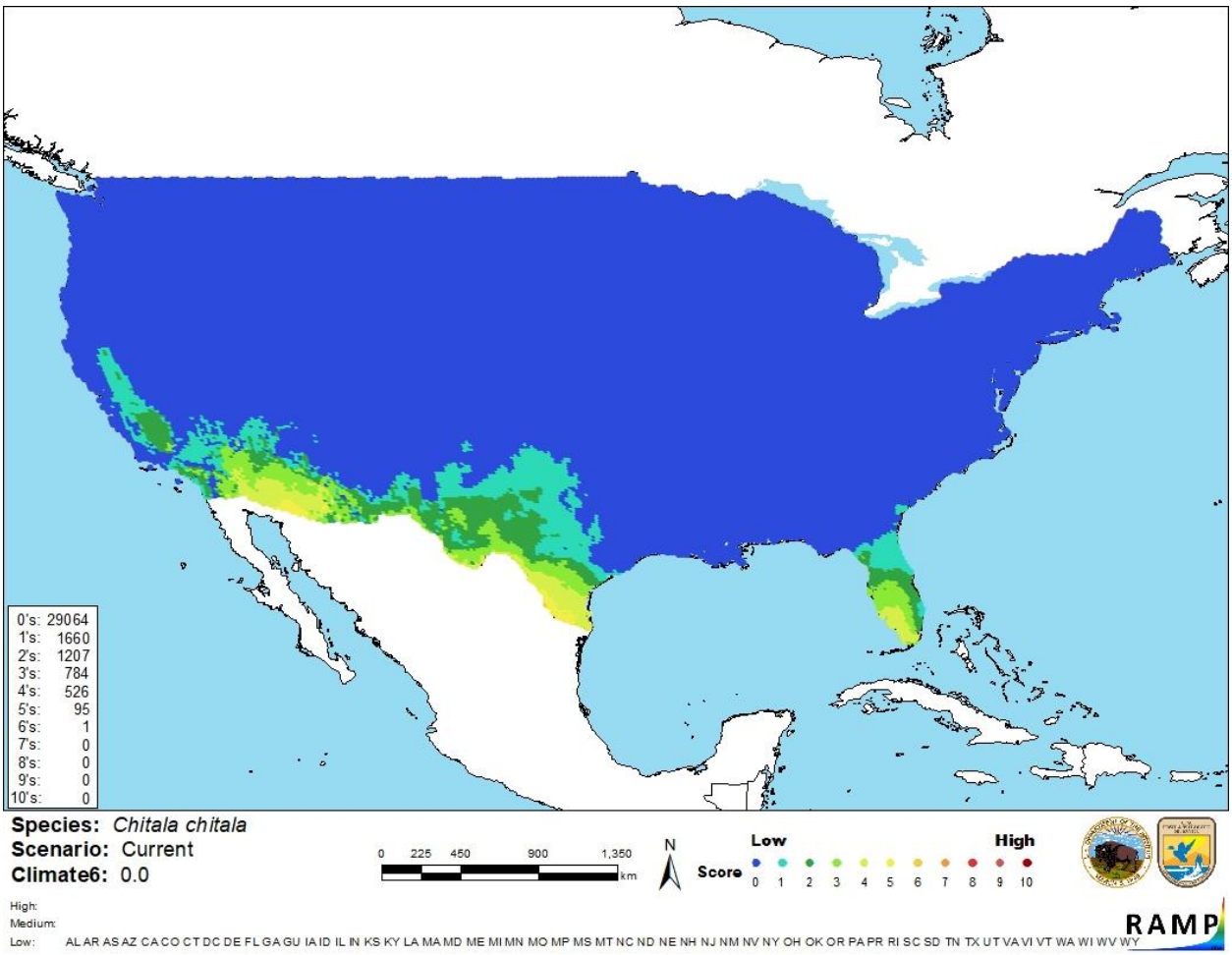

Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Chitala chitala* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). Counts of climate match scores are tabulated on the left. 0 = Lowest match, 10 = Highest match.

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≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

7 Certainty of Assessment

The certainty of assessment for *Chitala chitala* is low. There was some information on the biology and environment of *Chitala chitala* but information was limited. *Chitala chitala* has been reported as introduced to some countries and has become established at least one. There is some information on potential impacts of introduction but it is also very limited.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Clown knifefish (*Chitala chitala*) is a fish native to Bangladesh, India, Nepal, and Pakistan. Adults inhabit freshwater rivers, lakes, beels, nullahs in the plains, reservoirs, canals and ponds. They are also a popular aquarium and sport fish. The history of invasiveness is None Documented. It has been reported as introduced to Sri Lanka, the Philippines, Myanmar, and China, and become established in Sri Lanka. Potential impacts may occur as a result of predation but there has been no scientifically defensible documentation of this. The overall climate match for the contiguous United States was low. The certainty of assessment is low. There were some areas of medium match along the southern border and in southeast Florida; there were no areas of high match. The overall risk assessment category for *Chitala chitala* is uncertain.

Assessment Elements

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

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Ukkatawewat, S. 2005. The taxonomic characters and biology of some important freshwater fishes in Thailand. Manuscript. National Inland Fisheries Institute, Department of Fisheries, Ministry of Agriculture, Bangkok, Thailand.