

Small Snakehead (*Channa asiatica*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, June 2017
Revised, December 2018
Web Version, 9/29/2021

Organism Type: Fish
Overall Risk Assessment Category: Uncertain



Photo: CAFS. Licensed under Creative Commons. Available:
<http://fishbase.org/summary/Channa-asiatica.html>. (December 2017).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

“Asia: Yangtze River basin in central China, Taiwan, Hainan Island to the Red River basin of northern Viet Nam [Zhang et al. 2002.]”

From Zhuang (2012):

“The species is recorded from China (Yangtze River basin, the Xun River basin in Guangxi and Guangdong provinces, Taiwan, and Hainan Island; Zheng 1989) to the Red River basin of northern Viet Nam.”

Status in the United States

No reported wild introductions or populations in the United States. No records of *Channa asiatica* in trade in the United States were found.

All species in the family Channidae were officially listed as injurious wildlife species by the U.S. Fish and Wildlife Service in 2002 under 18.U.S.C.42(a)(1) because of the risk they may cause harm to interests of the United States (USFWS 2002). The importation of live specimens of all species in the family Channidae is prohibited into the United States, any territory of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States, or any shipment between the continental United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, or any possession of the United States unless accompanied by an approved permit.

From Connecticut Secretary of State (2016):

“Live fish or live fish eggs of the following species, genera or families shall not be imported into the state or possessed except that, when it is in the public interest, permits for the importation or possession of specimens may be issued, at the discretion of the Commissioner, for research or public display purposes or as provided for in section 26-40d-1 of the Regulations of Connecticut State Agencies:

[...]

(21) Snakehead (including all members of the genus *Channa* and *Parachanna* or their generic synonyms of *Bostrychoides*, *Ophicephalus*, *Ophiocephalus* and *Parophiocephalus*);”

From Georgia DNR (2020):

“The exotic species listed below, except where otherwise noted, may not be held as pets in Georgia.

[...]

Snakeheads; all species of genera *Ophicephalus* and *Channa*”

Idaho lists all species of the genera *Channa* as invasive species (Idaho Office of the Administrative Rules Coordinator 2019). “No person may possess, cultivate, import, ship, or transport any invasive species, into or through the state of Idaho following the effective date of this rule, unless the person possessing, importing, shipping or transporting has obtained a permit [...].”

From Kentucky General Assembly (2019):

“The live aquatic organisms established in subsections (1) through (7) of this section shall not be imported, bought, sold, or possessed in aquaria:

[...]

(5) Genus *Channa* - snakeheads of Asia and Africa;”

From State of Nevada (2018):

“Except as otherwise provided in this section and NAC 504.486, the importation, transportation or possession of the following species of live wildlife or hybrids thereof, including viable embryos or gametes, is prohibited:

[...]

All species in the genera *Ophicephalus* and *Channa*”

Ohio lists all species of *Channa* as invasive species (ODNR 2020). “Under Ohio Administrative Code 1501:31-19-01, it shall be unlawful for any person to possess, import or sell live individuals of the species listed below. With the exception of White Perch, the species listed below must be headless, preserved in ethanol or formaldehyde, or eviscerated (internal organs removed).”

From Oklahoma Secretary of State (2019):

“Until such time as is necessary for the Department of Wildlife Conservation to obtain adequate information for the determination of other harmful or potentially harmful exotic species, the importation into the State and/or the possession of the following exotic fish or their eggs is prohibited:

[...]

Snakehead groups: *Opicephalus* spp., and *Channa* spp.”

From Washington State Senate (2019):

“The following species are classified as prohibited level 1 species:

[...]

Family Channidae: China fish, snakeheads: All members of the genus *Channa*.”

All species of the family Channidae are listed as prohibited species in Alabama (Alabama DCNR 2019). “No person, firm, corporation, partnership, or association shall possess, sell, offer for sale, import, bring, release, or cause to be brought or imported into the State of Alabama” a prohibited species.

From Arkansas GFC (2019):

“It is unlawful to import, transport, or possess any live species commonly known as snakehead (Family channidae), [...]”

From Arizona Office of the Secretary of State (2013):

“Fish listed below are considered restricted live wildlife:

[...]

10. All species of the family Channidae. Common name: snakehead.”

From California Department of Fish and Wildlife (2019):

“Restricted species include:

[...]

Family Channidae-Snakeheads: All species”

The Florida Fish and Wildlife Conservation Commission has listed all species in the family Channidae as prohibited species. Prohibited nonnative species (FFWCC 2021), “are considered to be dangerous to Florida’s native species and habitats or could pose threats to the health and welfare of the people of Florida.”

Hawaii lists all species of the family Channidae (except for *Channa striata*) on the prohibited species list (Hawaii Department of Agriculture 2019).

From Louisiana State Legislature (2019):

“No person, firm, or corporation shall at any time possess, sell, or cause to be transported into this state by any other person, firm, or corporation, without first obtaining the written permission of the secretary of the Department of Wildlife and Fisheries, any of the following species of fish: [...] Channidae (snakeheads);”

From Mississippi Secretary of State (2019):

“All species of the following animals and plants have been determined to be detrimental to the State's native resources and further sales or distribution are prohibited in Mississippi. No person shall import, sell, possess, transport, release or cause to be released into the waters of the state any of the following aquatic species or hybrids thereof.

[...]

Snakeheads Family Channidae *****[all species in the family]”

Channa asiatica falls within Group IV of New Mexico’s Department of Game and Fish Director’s Species Importation List (New Mexico Department of Game and Fish 2010). Group IV species “are prohibited for the general public but may be allowed for, scientific study, department approved restoration and recovery plans, zoological display, temporary events/entertainment, use as service animal or by a qualified expert.”

From SCDNR (2010):

“A person may not possess, sell, offer for sale, import, bring, or cause to be brought or imported into this State or release into the waters of this State the following fish or eggs of the fish:

[...]

(10) snakehead (all members of family Channidae).”

From Texas Parks and Wildlife (2020):

“The organisms listed here are legally classified as exotic, harmful, or potentially harmful. No person may possess or place them into water of this state except as authorized by the department. Permits are required for any individual to possess, sell, import, export, transport or propagate listed species for zoological or research purposes; [...]

Snakeheads, Family Channidae All species”

From Utah Office of Administrative Rules (2019):

“All species of fish listed in Subsections (2) through (30) are classified as prohibited for collection, importation and possession [...] (25) Snakehead, (All species) family Channidae.”

From Virginia DWR (2020):

“A special permit is required, and may be issued by the Department, if consistent with the Department’s fish and wildlife management program, to import, possess, or sell the following non-native (exotic) amphibians, fish, mollusks, aquatic invertebrates, and reptiles: [...] snakeheads,”

Means of Introductions in the United States

No reported wild introductions in the United States.

Remarks

No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2018), *Channa asiatica* (Linnaeus 1758) is the current valid name for this species. It was originally described as *Gymnotus asiaticus* Linnaeus 1758.

From ITIS (2018):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Channoidei
Family Channidae
Genus *Channa*
Species *Channa asiatica* (Linnaeus 1758)

Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 20.0 cm TL male/unsexed; [Man and Hodgkiss 1981] common length : 8.7 cm SL male/unsexed; [Nichols 1943]”

Environment

From Froese and Pauly (2018):

“Freshwater; benthopelagic.”

“22°C - 28°C [Baensch and Riehl 1991] [assumed to be recommended aquarium temperature]”

From Shao (1993):

“Prefer still water or slow-running river with lots of caves and aquatic vegetation to hide, can be found in paddy field [...]”

Climate

From Froese and Pauly (2018):

“Tropical; [...]”

Distribution Outside the United States

Native

From Froese and Pauly (2018):

“Asia: Yangtze River basin in central China, Taiwan, Hainan Island to the Red River basin of northern Viet Nam [Zhang et al. 2002.]”

From Zhuang (2012):

“The species is recorded from China (Yangtze River basin, the Xun River basin in Guangxi and Guangdong provinces, Taiwan, and Hainan Island; Zheng 1989) to the Red River basin of northern Viet Nam,”

Introduced

From Froese and Pauly (2018):

“Also reported in Japan and Sri Lanka [Masuda et al. 1984]”

Means of Introduction Outside the United States

From NIES (2018):

“Deliberate: For aquaculture.”

Short Description

From Shao (1993):

“Head moderately large. Snout short. Mouth large and protractile. Lower jaw longer than upper, posterior end of upper jaw reaching posterior margin of eye, both upper and lower jaw with teeth. Barbell absent. Body cylindrical, posterior laterally compressed. Scales large and cycloid, scales on calvaria even larger, lateral line scales complete. L.l. : 41-45; dorsal fin rays : 27-29; anal fin rays : 54-57; dorsal and anal fins long, pelvic fin absent, anus near anal fin origin, caudal fin round, dorsal fin origin above pectoral fin origin. Greenish or dark grayish, ventral surface lighter. Side of body patterned with 8-9 dark stripes in an arrowhead shape [...], and the tip toward head. A black blotch on end of caudal peduncle.”

Biology

From Froese and Pauly (2018):

“Generally restricted to relatively narrow regions characterized by humid rainforest climate [Zhang et al. 2002]. Feed on crustaceans, insect larvae and fish.”

From Shao (1993):

“[...] able to breath atmospheric air. Ambush predator, feed on small fish, shrimp and other aquatic creatures. No nests formed, but parental”

Human Uses

From Zhuang (2012):

“Utilized in fisheries, and found in small numbers in the ornamental fish trade.”

From NIES (2018):

“Deliberate: For aquaculture.”

Diseases

No information was found on diseases. **No OIE-reportable diseases (OIE 2021) were found to be associated with *Channa asiatica*.**

Threat to Humans

From Froese and Pauly (2017):

“Harmless”

3 Impacts of Introductions

This species has been reported as introduced outside of its native range but the impacts of its introduction are unknown.

Channa asiatica is listed as injurious wildlife under the Lacey Act and is regulated in many States, see section 1.

4 History of Invasiveness

Channa asiatica has been reported as introduced to Sri Lanka and Japan. In Japan *C. asiatica* was deliberately released for aquaculture purposes which resulted in an established population. Impacts of this introduction/establishment are unknown, as are specifics regarding this species trade presence. Release of *C. asiatica* is legally prohibited in some localities of Japan and throughout the United Kingdom. The importation of live specimens of all species in the family Channidae is prohibited into the United States, any territory of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States, or any shipment between the continental United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, or any possession of the United States unless accompanied by an approved permit. Despite the restrictions on importation and transport in the United States of the genus *Channa*, due to its injurious nature, the history of invasiveness is classified as Data Deficient.

5 Global Distribution



Figure 1. Known global distribution of *Channa asiatica*. Observations are reported from southern China, Taiwan, Thailand, and Myanmar. Map from GBIF Secretariat (2018). The location in the United States was not used in the climate match since the individual was a preserved specimen in a museum collection and not from a wild population.

6 Distribution Within the United States

No wild populations of *Channa asiatica* have been reported in the United States.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Channa asiatica* in the contiguous United States was the highest in the southeast extending from Florida up to South Carolina and West to Texas. There was some medium match in the Mid-West with the rest of the contiguous United States having a low climate match. The overall climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for *Channa asiatica* in the contiguous United States was 0.046, medium. (Scores between 0.005 and 0.103, exclusive, are classified as medium.) Florida, Georgia, Kansas, Oklahoma, and South Carolina had high individual Climate 6 scores. Arizona, Montana, North Carolina, and Texas had medium individual scores, and all other States had low individual scores.

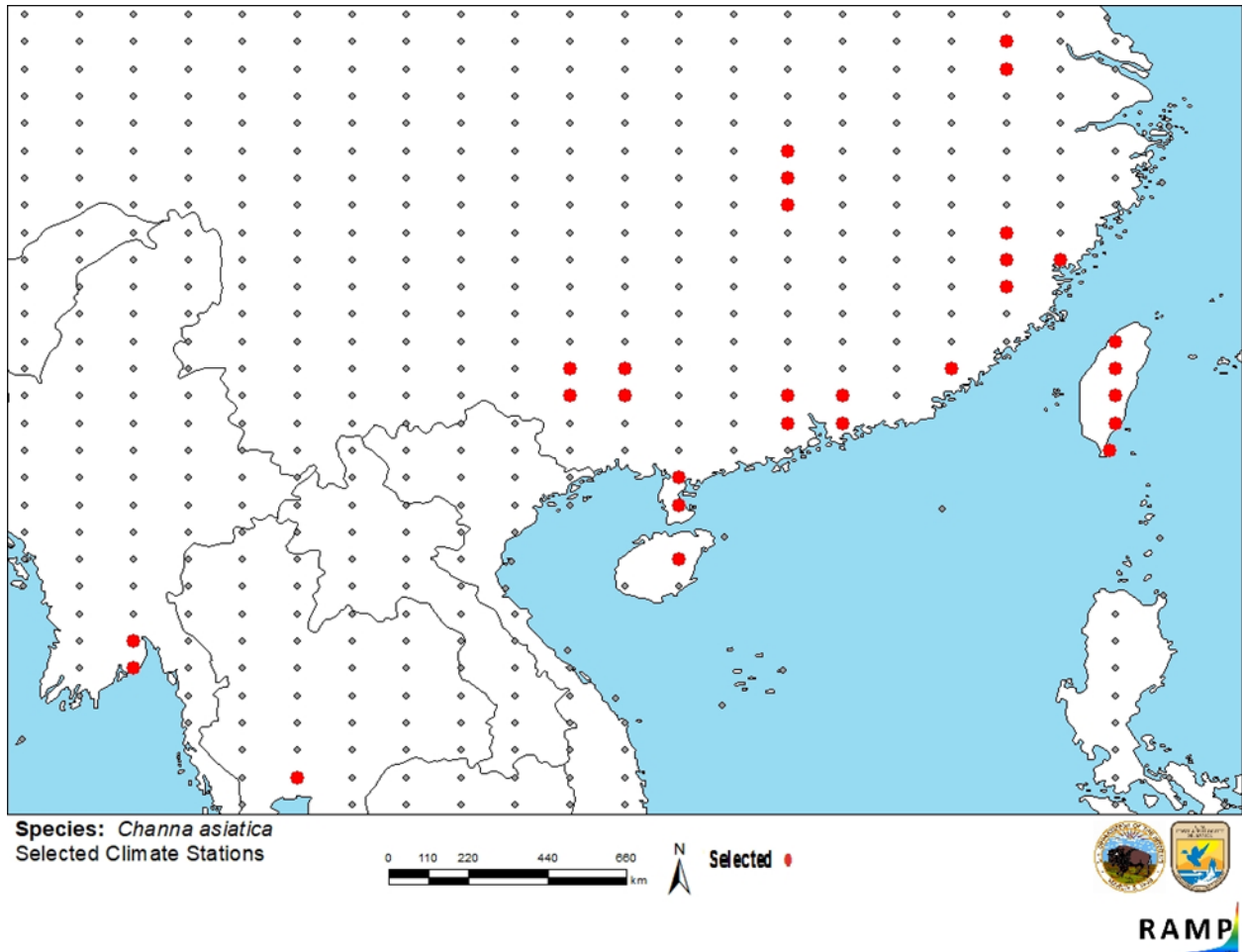


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in eastern Asia selected as source locations (red; China, Taiwan, Thailand, Myanmar) and non-source locations (gray) for *Channa asiatica* climate matching. Source locations from GBIF Secretariat (2018). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

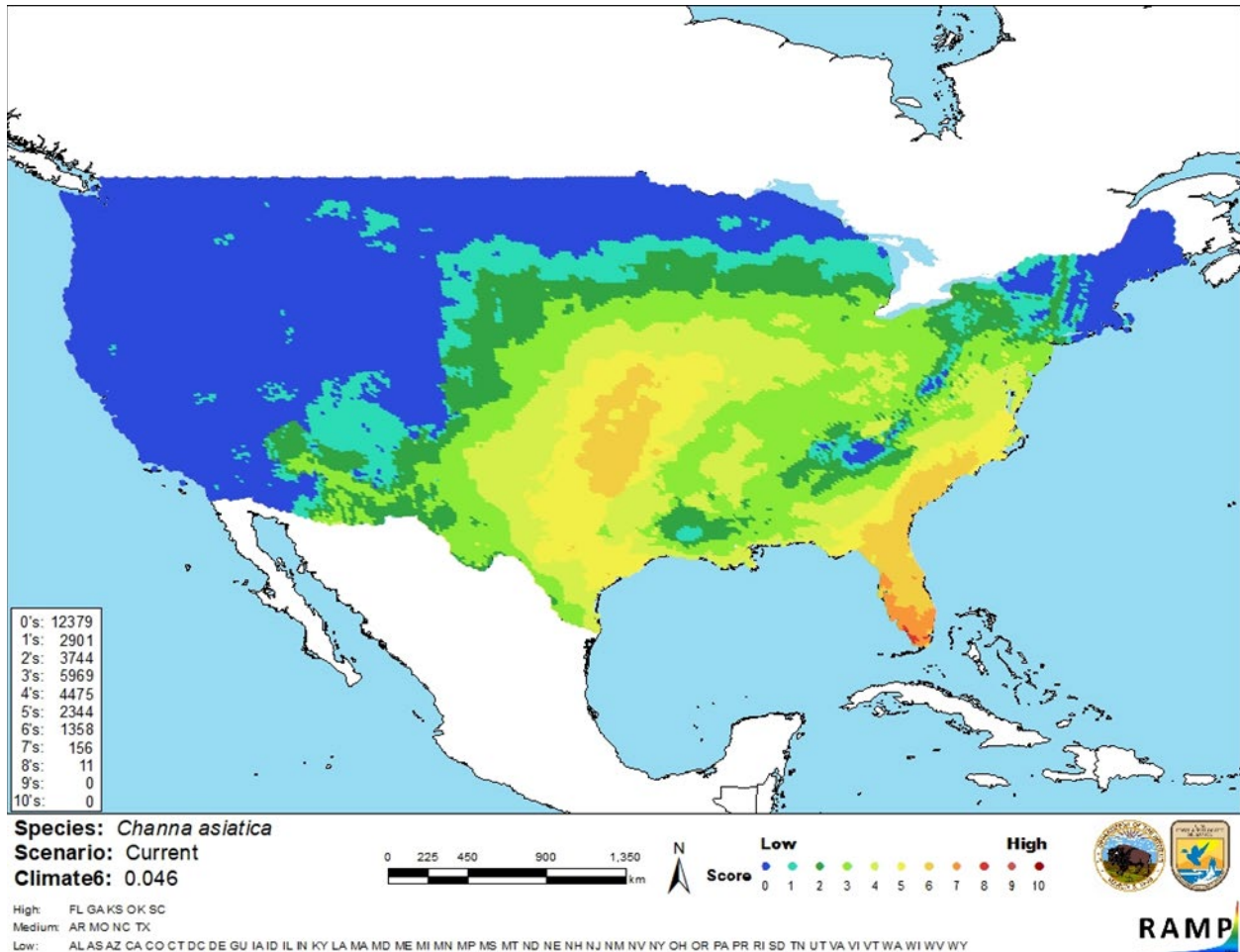


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Channa asiatica* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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
≥ 0.103	High

8 Certainty of Assessment

The certainty of this assessment is low. Although there is some information on where the species is found and its description there is very little information on its biology and potential impacts. While this species has been introduced to Sri Lanka and Japan, there is no information reported on the impacts of these introductions.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Small snakehead (*Channa asiatica*) is a freshwater fish native to China, Taiwan, and Vietnam. Like other *Channa* species, *C. asiatica* can breathe atmospheric air. This fish is present in fisheries and is in the aquarium trade. All species of Channidae are listed as injurious wildlife under the Lacey Act in the United States, and many States have restrictions as well. There have been populations reported as introduced or established outside of their native range, but no information was found regarding impacts of introduction. Therefore, the history of invasiveness is classified as Data Deficient. *C. asiatica* has an overall Medium climate match in the contiguous United States. Much of the northern and western areas had low match, with high match being found in the southeast and central Great Plains. Due to the lack of information regarding impacts of the introduced populations, the certainty of assessment is Low. The overall risk assessment for *Channa asiatica* is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): Data Deficient**
- **Overall Climate Match Category (Sec. 7): Medium**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information:** All species of Channidae are listed as injurious wildlife under the Lacey Act.
- **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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