

# Mandarin Fish (*Siniperca chuatsi*)

## Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, January 2022  
Revised, February 2022  
Web Version, 8/22/2022

Organism Type: Fish  
Overall Risk Assessment Category: Uncertain



Photo: Fredlyfish4. Licensed under Creative Commons Attribution-Share Alike 4.0 International. Available: [https://commons.wikimedia.org/wiki/File:Siniperca\\_chuatsi.jpg](https://commons.wikimedia.org/wiki/File:Siniperca_chuatsi.jpg) (January 2022).

## 1 Native Range and Status in the United States

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### Native Range

From Froese and Pauly (2022):

“Asia: Amur River basin and China.”

From Fricke et al. (2022):

“Distribution: East Asia: Pearl, Yangtze and Amur River basins (China and Russia).”

## Status in the United States

*Siniperca chuatsi* has not been reported as introduced or established in the wild in the United States.

This species has been reported in the aquarium trade in the United States:

From Aqua Imports (2022):

“Chinese Red Perch (*Siniperca chuatsi*)  
\$79.99 – \$99.99”

From Aquarium Fish Depot (2022):

“CHINESE RED PERCH (SINIPERCA CHUATSI) 3-3.5”  
\$117.99”

From 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 any of the following live fish or animals:

[...]

Any species of Chinese perch (*Siniperca spp.*);”

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. [...] Temperate Perches, Family Percichthyidae  
All species”

## Means of Introductions in the United States

*Siniperca chuatsi* has not been reported as introduced or established in the United States.

## Remarks

This ERSS was previously published in April 2018. Revisions were completed to incorporate new information and conform to updated standards.

*Siniperca chuatsi* is also commonly referred to as Chinese perch. According to Fricke et al. (2022), *Siniperca chuatsi bergi*, *Actenolepis ditmarii*, and *Siniperca chuatsi multilepis* are synonyms of *Siniperca chuatsi*. The valid name and all synonyms were used for information searches for this screening.

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

According to Fricke et al. (2022), *Siniperca chuatsi* (Basilewsky, 1855) is the current valid name for this species.

From ITIS (2022):

Kingdom Animalia  
Subkingdom Bilateria  
Infrakingdom Deuterostomia  
Phylum Chordata  
Subphylum Vertebrata  
Infraphylum Gnathostomata  
Superclass Actinopterygii  
Class Teleostei  
Superorder Acanthopterygii  
Order Perciformes  
Suborder Percoidei  
Family Percichthyidae  
Genus *Siniperca*  
Species *Siniperca chuatsi* (Basilewsky, 1855)

### Size, Weight, and Age Range

From Froese and Pauly (2022):

“Maturity:  $L_m$  ?, range 20 - ? cm

Max length : 70.0 cm TL male/unsexed; [Novikov et al. 2002]; max. published weight: 8.0 kg [Novikov et al. 2002]; max. reported age: 9 years [Novikov et al. 2002]”

### Environment

From Froese and Pauly (2022):

“Freshwater; benthopelagic; pH range: 7.0 – 7.4; dH range: 2 – 5; depth range 10 - ? m [Reshetnikov et al. 1997]. [...] 4°C – 22°C [Baensch and Riehl 1991; assumed to be recommended aquarium temperature];”

### Climate

From Froese and Pauly (2022):

“Temperate; [...] 53°N – 34°N, 113°E – 142°E”

## **Distribution Outside the United States**

### **Native**

From Froese and Pauly (2022):

“Asia: Amur River basin and China.”

From Fricke et al. (2022):

“Distribution: East Asia: Pearl, Yangtze and Amur River basins (China and Russia).”

### **Introduced**

From NIES (2022):

“Introduced range in other countries [...] Taiwan”

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

From FAO (2022a):

“REASONS OF INTRODUCTION [...] aquaculture”

## **Short Description**

From Froese and Pauly (2022):

“Big mouth, upper jaw extend trailing edge of eye. High body, side flat, backside with ridges. Anomalistic macula and dark spots on the sides; 4-5 dark horizontal stripes near the base of dorsal fin [Zhang et al. 2009].”

From FAO (2022b):

“Body compressed. Lower jaw protruding, upper jaw extending behind eyes. Mouth cavity along both upper and lower lips densely serrated with saw-like teeth. Lower jaw with 4-5 large sharp rays. Rear edge of gill cover has two flat sharp spines on each side. Scales round and small. Body brownish yellow, very shiny with irregularly placed coloured spots. Normally black or dark grey stripes from the lips through the eyes above the lateral but along the dorsal line. Well developed dorsal fins with mainly hard spines located anteriorly, and extended posteriorly with round tips. Pectoral, anal and tail fins round shaped. Three sharp spines anterior to both abdominal and anal fins.”

## **Biology**

From Froese and Pauly (2022):

“Adults inhabit rivers [Reshetnikov et al. 1997]. Are demersal piscivores which have very specialized feeding habits--as soon as they start feeding, they feed solely on fry of other fish species. Typical of stalking predators, they rely on vision for following the movement of prey

before leaping forward and snapping at the victim. Prey consist mostly of diurnal fishes whose eyes have color vision and high acuity but cannot function at night. The habitat of the Chinese perch is usually rich in macrophytes and might be very turbid during rainy season [Liang et al. 1998].”

From FAO (2022b):

“Mandarin fish dwell in lakes and river systems, preferring clean water and to hide amongst the stones, tree roots and densely grown aquatic grasses at the bottom. When the temperature drops to 1-5 °C in the winter, the fish stay calm in deep water for over-wintering, but when it rises above 15 °C, the fish begin to actively search for food. Mandarin fish are generally nocturnal, feeding at night but staying quiet in sheltered areas under natural conditions in the daytime. However, in controlled conditions, when being farmed, they will take food even in the daytime. Mandarin fish have a broad temperature tolerance range, which is why they are found in most parts of China.”

“Mandarin fish are carnivorous, feeding on live fish, shrimps and other aquatic animals that are smaller than themselves, particularly fish. Mandarin fish will not take static aquatic animals, even if they are immediately adjacent, but as soon as the targets begin to move, they swiftly catch them without hesitation. Mandarin fish begin to consume fish fry of other species at four-five days old. In the wild they prefer to take Wuchang fish (*Megalobrama amphylocephalus*) at first because of its body shape, but all spindle-like fish are vulnerable. When mandarin fish are kept under controlled conditions cannibalism occurs unless sufficient food is provided. Mandarin fish grow rapidly, reaching 400-600 g within one year and 1-1.5 kg in the second year. After this, their growth rate declines, both in weight and length, and females grow faster than the males in the third year.”

“Mandarin fish do not reproduce until the temperature exceeds 21 °C, the optimum temperature being 26-30 °C. Due to the different climatic conditions from the south to the north of China, the breeding season varies a great deal. In the south it occurs between March and August, while in the central part it occurs between May and August, June and July being the most active period. During the breeding season spawners gather densely at the river bend or confluence where there is an enhanced water current. Spawning takes place in a flowing water environment, only at night; normally this lasts for three-six hours but very occasionally may last 24 hours. Females mature in two years at a minimal body weight of 160-250 g (21 cm), while males take only one year, the smallest being about 80 g (16 cm). Generally, fecundity is 30 000-200 000 eggs/fish, depending on the size of the female. Mandarin eggs are 1.2-1.4 mm in size and semi-pelagic in flowing water, but sink in stagnant water.”

## **Human Uses**

From Froese and Pauly (2022):

“Fisheries: commercial; aquaculture: commercial”

From Liang et al. (2001):

“Chinese perch is one of the most valuable food fishes in China”

From NIES (2022):

“Imported to Japan as pet animal in past.”

## Diseases

**No records of OIE-reportable diseases (OIE 2022) were found for *Siniperca chuatsi*.**

He et al. (2002) states *Siniperca chuatsi* was the first known host species of infections spleen and kidney necrosis virus (ISKNV).

Poelen et al. (2014) lists *Siniperca chuatsi* as a host for the following parasites and pathogens: *Hebesoma violenteum*, *Neoechinorhynchus violetum*, *Ozakia playiorchis*, *Azygia siniperca*, *Micracanthorhynchina*, *Heterosentis*, *Tetracampos magnum*, *Ancyrocephalus mogurndae*, *Capillaria sinipercae*, *Contracaecum siniperca*, *Cucullanus cyprini*, *Dietziella laminae*, *Bucephalus skrjabini*, *Dollfustrema fochowense*, *Parabucephalopsis prosthorchis*, *Dollfustrema vaneyi*, *Plagioporus isagi*, *Urotrema proeilecitha*, *Helicometra sinipercae*, *Potamogenes schistorchis*, *Nicollam*, *Urotrematulum sinipercae*, *Plagiorchis sinipercae*, *Genarchopsis goppo*, *Sinineobucephalopsis*, *Nicolla skrjabini*, *Coitocaecum plagiorchis*, *Isoparorchis hypselobagri*, *Diplostomum*, *Gnathostoma hispidum*, *Phyllodistomum*, *Gnathostoma spinigerum*, *Aeromonas veronii*, *Dollfustrema hefeiensis*, *Ancyrocephalus mogurndae*, *Kommabacillus (Vibrio cholerae)*, *Camallanus cotti*, mandarin fish ranavirus, *siniperca chuatsi* virus, Infectious spleen and kidney necrosis virus, and *siniperca chuatsi* rhabdovirus.

FAO (2022b) lists the following diseases and agents of *Siniperca chuatsi*: white skin disease, *Pseudomonas dermoalba*; gill rot disease, *Myxococcus piscicola*; Trichodina disease, *Trichodina* spp.; Cryptobia disease, *Cryptobia branchialis*; and white spot disease, *Ichthyophthirius multifiliis*.

From Zhang and Li (1999):

“Three different kinds of viruses, the spherical virus SCSV with a diameter of about 280 nm, the rhabdovirus SCRIV with a size of about 250 x 120 nm, and the baculovirus SCBV with a size about 200 x 100 nm, were observed from the tissues of diseased mandarin fish *Siniperca chuatsi* with outbreak of infection and acute lethality.”

## Threat to Humans

From Froese and Pauly (2022):

“Harmless”

### 3 Impacts of Introductions

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No known impacts of introductions could be found for *Siniperca chuatsi*, the following are potential impacts of its introduction outside of its native range.

From FAO (2022a):

“Socioeconomic effects: probably some”

From NIES (2022):

“Potentially: Predation on and competition with native species. In cases of accidental introduced to fish aquaculture farm, this species caused great damage.”

*S. chuatsi* is regulated in Alabama and Texas.

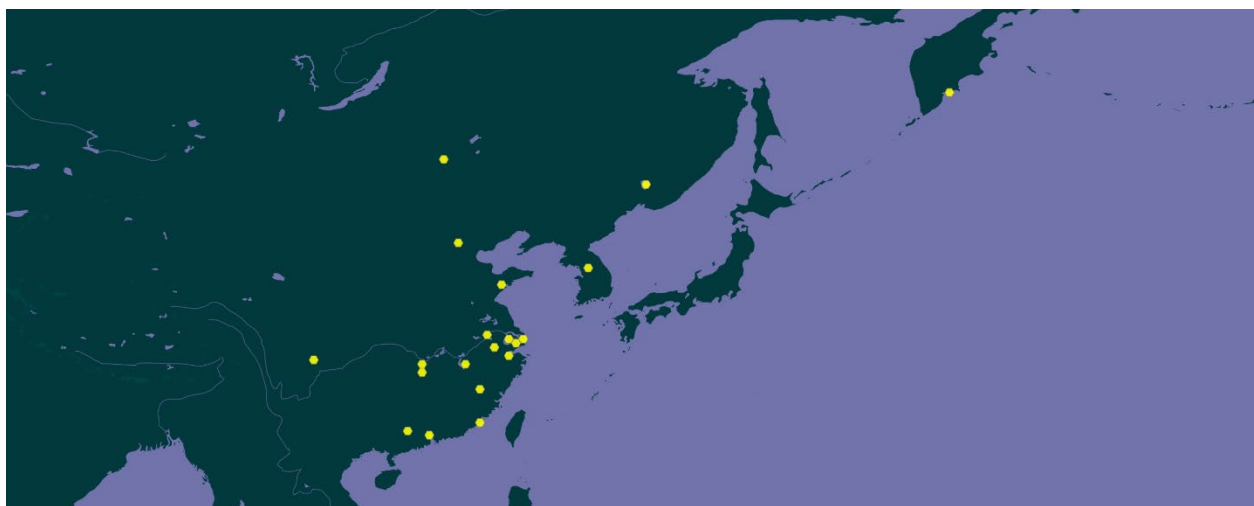
### 4 History of Invasiveness

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The history of invasiveness for *Siniperca chuatsi* is classified as Data Deficient. It has been introduced in Taiwan and established a population. No studies on impacts from that introduction were found and no other information regarding that introduction has been documented. It is hypothesized that this introduction has socioeconomic effects, but that is not confirmed. In cases of accidental introductions at aquaculture farms, this species was known to prey on and compete with native species, but these observations were not reported from wild populations.

### 5 Global Distribution

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**Figure 1.** Known global distribution of *Siniperca chuatsi*. Observations are reported from China, Russia, and Taiwan. Map from GBIF Secretariat (2022). Points in Korea and Mongolia do not represent established populations and were not used in the climate match analysis.

## 6 Distribution Within the United States

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*Siniperca chuatsi* has not been reported as introduced or established in the United States.

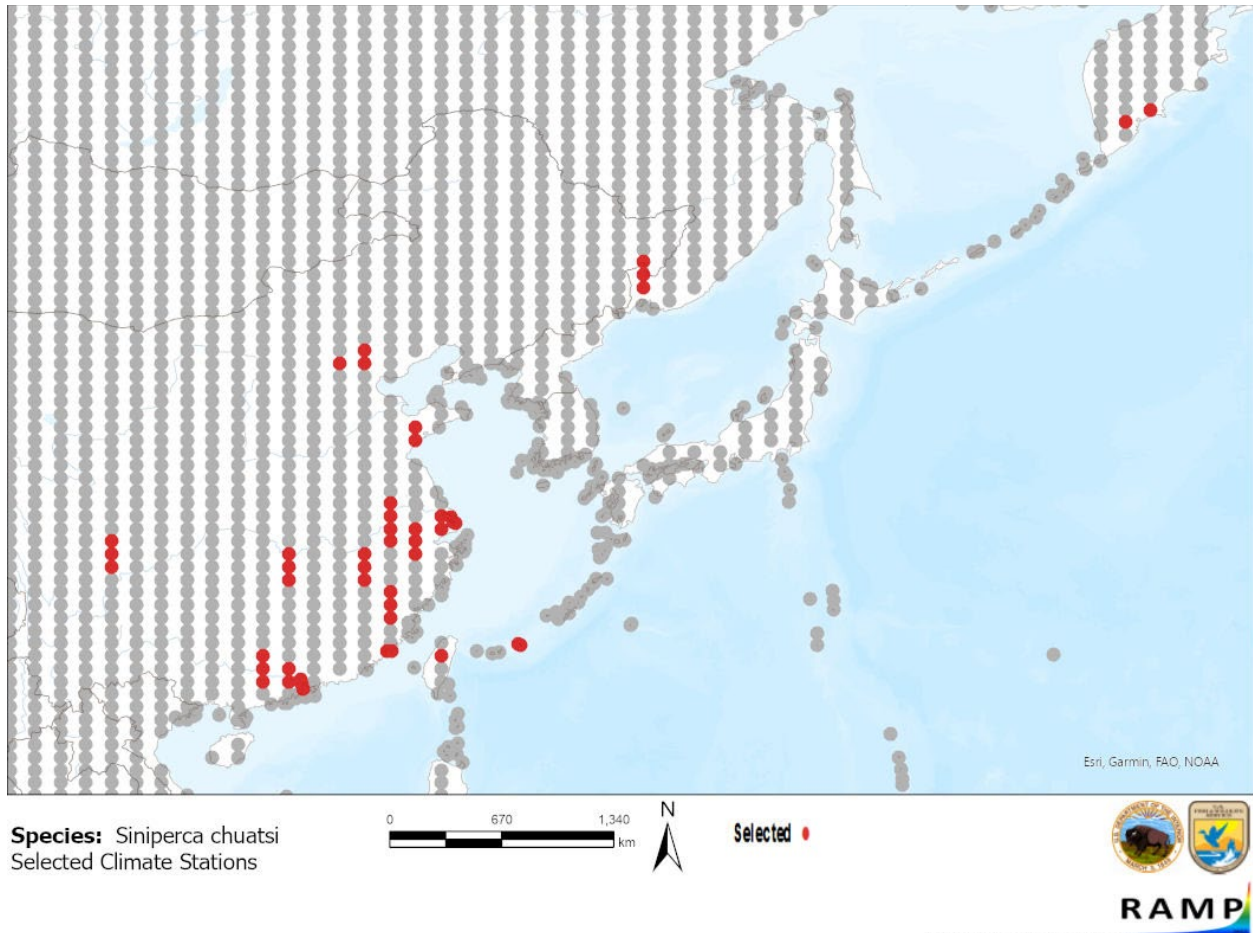
## 7 Climate Matching

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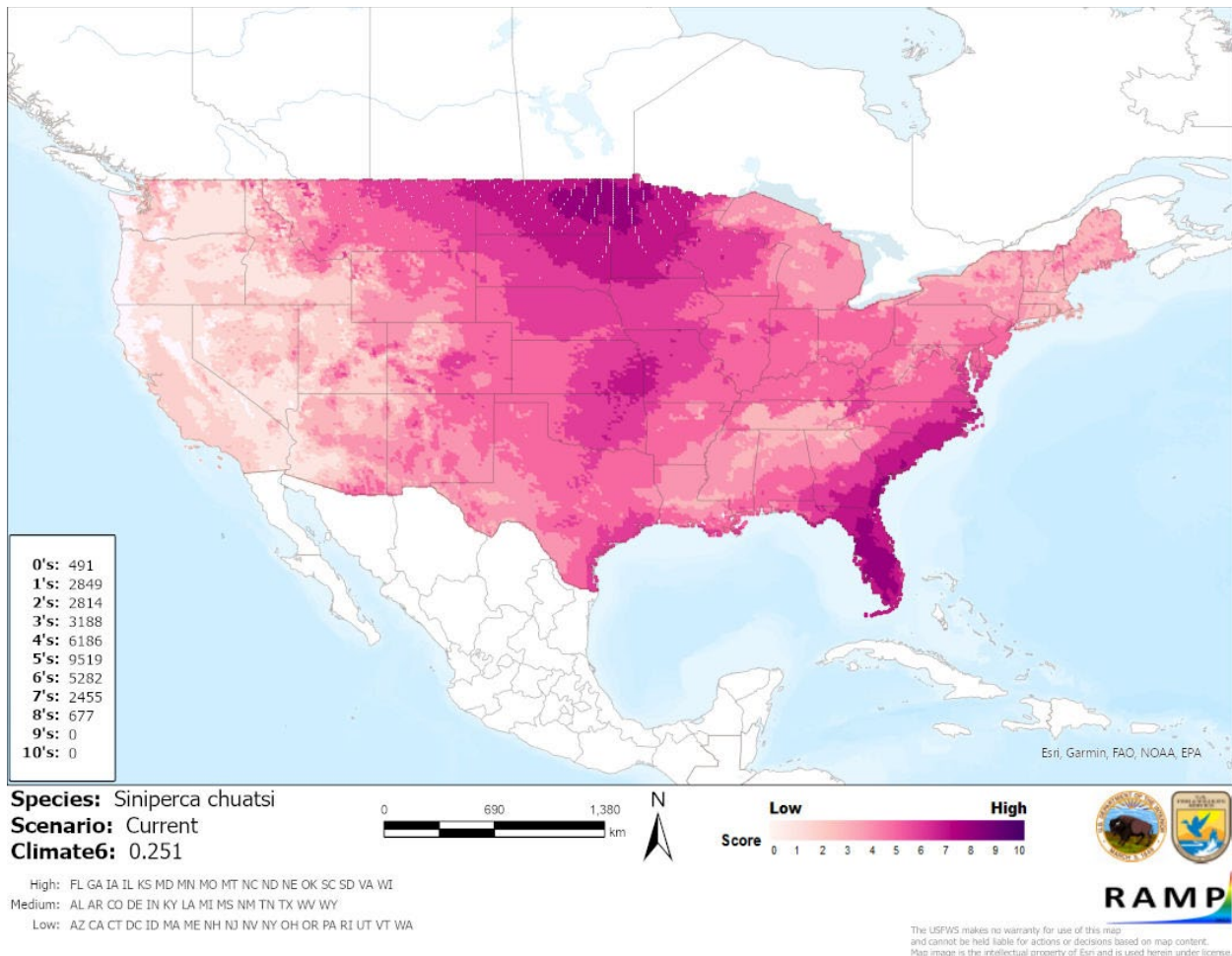
### Summary of Climate Matching Analysis

The climate match for *Siniperca chuatsi* in the contiguous United States was generally highest in Northern midwestern States boarding Canada and Florida. There were high to medium matches throughout the Midwest but the highest matches were in the Northern reaches of this zone along with central Florida and along the coast of the Atlantic ocean. The overall Climate 6 score (Sanders et al. 2021; 16 variables; Euclidean distance) was 0.251, high (scores greater than or equal to 0.103, are classified as high). Florida, Georgia, Iowa, Illinois, Kansas, Maryland, Minnesota, Missouri, Montana, North Carolina, North Dakota, Nebraska, Oklahoma, South Carolina, South Dakota, Virginia, and Wisconsin had high individual Climate 6 scores. Alabama, Arkansas, Colorado, Delaware, Indiana, Kentucky, Louisiana, Michigan, Mississippi, New Mexico, Tennessee, Texas, West Virginia, and Wyoming had medium individual Climate 6 scores. All other States had low individual Climate 6 scores.





**Figure 2.** RAMP (Sanders et al. 2021) source map showing weather stations in Eastern Asia selected as source locations (red; China, Russia, and Taiwan) and non-source locations (gray) for *Siniperca chuatsi* climate matching. Source locations from GBIF Secretariat (2022). 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. 2021) climate matches for *Siniperca chuatsi* in the contiguous United States based on source locations reported by GBIF Secretariat (2022). Counts of climate match scores are tabulated on the left. 0/Light Pink = Lowest match, 10/Dark Purple = 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

There is adequate information on the biology of *Siniperca chuatsi*. However, more information is needed on the impacts of introductions of this species. This species was reported as introduced to Taiwan. This introduction may potentially have socioeconomic effects and it may prey upon native species, but no actual impacts have been documented and no other information is

available regarding that introduction. With limited information about its history of invasiveness and impacts of introduction, the certainty of this assessment is Low.

## 9 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Siniperca chuatsi*, the Mandarin fish, is a freshwater perch native to the Pearl and Amur River basins in China and Russia. This species is used in aquaculture and is host to several parasites and diseases. *S. chuatsi* has not been recorded as introduced or established in the wild of the United States but can be found for sale in the Aquarium trade from multiple sources. *S. chuatsi* is regulated in Alabama and Texas. It has been reported as introduced to Taiwan, but no other information regarding that introduction has been documented. It is hypothesized that this introduction could have socioeconomic effects and that this species can prey upon native species, but that is not confirmed. For that reason, the history of invasiveness is classified as Data Deficient. *S. chuatsi* has a High to medium climate match within the contiguous United States with the Northern Midwest and Florida region having the highest match. The overall Climate 6 score for the contiguous United States is High. The certainty of assessment is Low because of the lack of impacts of introductions. The overall risk assessment category for *S. chuatsi* is Uncertain.

### Assessment Elements

- **History of Invasiveness (Sec. 4): Data Deficient**
- **Overall Climate Match Category (Sec. 7): High**
- **Certainty of Assessment (Sec. 8): 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.**

Alabama [DCNR] Department of Conservation and Natural Resources. 2019. Restrictions on possession, sale, importation and/or release of certain animals and fish. Alabama Department of Conservation and Natural Resources Administrative Code, Chapter 220–226.

Aqua Imports. 2022. Chinese red perch (*Siniperca chuatsi*). Available: <https://www.aqua-imports.com/product/chinese-red-perch-siniperca-chuatsi/> (January 2022).

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- Poelen JH, Simons JD, Mungall CJ. 2014. Global Biotic Interactions: an open infrastructure to share and analyze species-interaction datasets. *Ecological Informatics* 24:148–159.

Sanders S, Castiglione C, Hoff M. 2021. Risk Assessment Mapping Program: RAMP. Version 4.0. U.S. Fish and Wildlife Service.

Texas Parks and Wildlife. 2020. Invasive, prohibited and exotic species. Austin: Texas Parks and Wildlife. Available:  
[https://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited\\_aquatic.phtml](https://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml) (November 2020).

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## 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.**

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