Three-lips (*Opsariichthys uncirostris*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, March 2012
Revised, April 2017
Web Version, 3/27/2018

Photo: Chinese Academy of Fishery Sciences. Licensed under Creative Commons Attribution-Noncommercial 3.0 Unported License. Available: http://www.fishbase.se/photos/PicturesSummary.php?StartRow=2&ID=22928&what=species&TotRec=8. (April 2017).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2017):

"Asia: Eastern Siberia to northern Korea and China. Also in Japan."

Status in the United States

This species has not been reported in the United States.

Means of Introductions in the United States

This species has not been reported in the United States.

Remarks
From GBIF (2016):

"SYNONYMS
Leuciscus uncirostris Temminck & Schlegel, 1846
Opsariichthys uncirostris subsp. *amurensis* Berg, 1932
Opsariichthys uncirostris subsp. *uncirostris*
Opsariichthys unirostris subsp. *amurensis* Berg, 1932"

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing
From ITIS (2017):

"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 Opsariichthys
Species *Opsariichthys uncirostris* (Temminck and Schlegel, 1846)"

"Taxonomic Status: valid"

Size, Weight, and Age Range
From Froese and Pauly (2017):

"Maturity: L_m 10.0 range ? - ? cm
Max length : 32.5 cm SL male/unsexed; [Reshetnikov 2003]; common length : 12.4 cm SL male/unsexed; [Nichols 1943]"

Environment
From Froese and Pauly (2017):

"Freshwater; benthopelagic."

"[…] 10°C - 22°C [Baensch and Riehl 1991; assumed to represent recommended aquarium water temperatures]"

Climate/Range
From Froese and Pauly (2017):

"Temperate; […] 54°N - 32°N, 114°E - 141°E"

Distribution Outside the United States
Native
From Froese and Pauly (2017):

"Asia: Eastern Siberia to northern Korea and China. Also in Japan."

Introduced
Froese and Pauly (2017) report *O. uncirostris* as established in the former USSR and in Tashkent, Uzbekistan, as a result of introductions from the Yangtze River, China, in 1961.

From Kurita et al. (2014):

"The piscivorous chub, *Opsariichthys uncirostris uncirostris*, originally exclusively inhabited large water areas [in Japan]; however, the species has been introduced and established in small irrigation ditches on Kyushu Island."

Means of Introduction Outside the United States
From Froese and Pauly (2017):

"Accidentally introduced together with Chinese carp fry into the Balykchi fish farm [Uzbekistan]. Escaped into the Syr-Darya river outlet channels. Numerous transports of fish seed helped them to penetrate into basins of other rivers [Khurshut 2001]."

From NIES (2017):

"Accidental: Hitchhiking on seed release of ayu (*Plecoglossus altivelis altivelis*)."

Short Description
From Froese and Pauly (2017):

"Dorsal spines (total): 2 - 3; Dorsal soft rays (total): 7; Anal spines: 3; Anal soft rays: 9. Enlarged anal fin with conspicuous rays."

Biology
From Froese and Pauly (2017):

"Spawn from June to August. Eggs are scattered over sand or gravel."

From Tsunoda et al. (2015):

"Fish prey, particularly ayu (*Plecoglossus altivelis altivelis*), was predominant in the three-lips diet, followed by terrestrial insects."

Human Uses

From Bakhtiyar et al. (2004):

"*Opsariichthys uncirostris amurensis* Berg L[ocal] C[ommercial]"

Diseases

From Okamura et al. (2014):

"Mortalities of three-lips *Opsariichthys uncirostris* occurred in a river in Shiga Prefecture, Japan, during the summer of 2013. The gills of diseased fish were heavily infected with the parasitic ciliate *Chilodonella hexasticha*. The intensity of parasite was 0.73-1.15 millions in dead fish, and 0.45-0.52 millions in apparently healthy fish. The cause of fish death may be a respiratory dysfunction by congestion due to the heavy infection with *C. hexasticha* on the gills. This is the first report of *C. hexasticha* infection of wild fish in Japan."

From Urabe et al. (2009):

"A fish disease caused by heavy infection with the metacercariae of an introduced trematode, *Parabucephalopsis parasiluri* Wang, 1985 (Digenea; Bucephalidae), has been spreading in fish in the Uji-Yodo River […] in central Japan since 2000 [Urabe et al. 2001; Ogawa et al. 2004]. The disease occurs in winter, and diseased fish have hemorrhages in their fins and eyes, and swim lethargically [Ogawa et al. 2004]. These metacercariae have been recorded in 14 fish species, but the symptoms are mainly displayed in some species of cyprinid fish, such as […] *Opsariichthys uncirostris* (Temminck and Schlegel) […] [Urabe et al. 2001, 2007, 2008; Ogawa et al. 2004]"

Yang (2007) report *O. uncirostris* as the host of two cestodes: *Bothriocephalus acheilognathi* Yamaguti 1934 and *B. obsariichthydis* Yamaguti, 1934.

From Cho et al. (2014):

"Human infections with FBTs [fishborne trematodes] are usually caused by habitual consumption of raw fish containing infective larvae, metacercariae. […] In the present study, *Metagonimus* spp. metacercariae were detected in a variety of fish species in Gangwon-do [province in the Republic of Korea], from 2009 to 2013. Among the positive fish, 16 species, i.e., […] *Opsariichthys uncirostris* […] have never been listed as the second intermediate hosts of Metagonimus spp. in Korea [Sohn 2009]. […] Ten species of freshwater fish (8 genera) […] have been listed as the second intermediate hosts for *C*[*entrocestus*] *armatus* in Korea [Sohn 2009]. In the present study, 15 fish species, i.e., […] *Opsariichthys uncirostris* […] are newly recorded as the second intermediate hosts."

No OIE-reportable diseases have been documented in this species.

Threat to Humans

From Froese and Pauly (2017):

"Potential pest [Welcomme, 1988]"

3 Impacts of Introductions

From Froese and Pauly (2017):

"Partially displaced local species in Tashkent where the species shows a better growth rate and higher fecundity than in native habitat."

From Kurita et al. (2008):

"*Opsariichthys uncirostris uncirostris* was introduced from Lake Biwa to several freshwater areas in Kyus[h]u Island, and the gut contents of this fish were observed in order to evaluate the effect of internal invasion on native aquatic organisms."

"Among the native species that were present in the gut of this exotic species, *Rhodeus ocellatus kurumeus* […], *Tanakia limbata*, and *T. lanceolata* are ranked as threatened species in the Japanese Red Data Book (Ministry of Environment, 2003). Although the E_i [food selective index] values for these native species were positive in several seasons, their average population was more than 50 individuals/50 casts […], suggesting that these threatened native species were not largely effected by the feeding behavior of *O. uncirostris uncirostris*. The E_i for *A*[*bbottina*] *rivularis*, another endangered native species, was also positive from October to November […]. Although the average annual of the [*sic*] population in this species was small (approximately 9.2), it increased from October to January. Therefore, this native species was estimated to be preyed upon by *O. uncirostris uncirostris* when its population size was large but not when its population size was small."

"In this field sampling, 28 individuals of *Acheilognathus tabira nakamurae*, which are classified as *Acheilognathus* spp., were present in the gut contents; this species is also a threatened native species (Ministry of Environment, 2003). The population of *Acheilognathus* spp. indicates one-seventh of the population of the exotic species (*Acheilognathus* spp./ *O. uncirostris uncirostris*, 4.5/29.1) and had positive E_i values in winter […]. These results suggest that *A. tabira nakamurae* is probably the most negatively effected [*sic*] species due to internal invasion of the study site by the exotic species *O. uncirostris uncirostris*."

4 Global Distribution

Figure 1. Known global established locations in East Asia of *O. uncirostris*. Map from GBIF (2016). Occurrences in southern China and Vietnam reported by GBIF (2016) were excluded because they do not represent established populations of *O. uncirostris*.

5 Distribution within the United States

This species has not been reported in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was medium-high in southern and central California; medium through the Plains region, southern Midwest, Mid-Atlantic region, and most of the coastal Southeast; and low in New England, southern Florida and Texas, the northern Great Lakes, and across significant portions of the West. Climate 6 proportion indicated that the contiguous U.S. has a medium climate match overall. Proportions between 0.005 and 0.103 are classified as a medium climate match; Climate 6 proportion for *O. uncirostris* was 0.054.

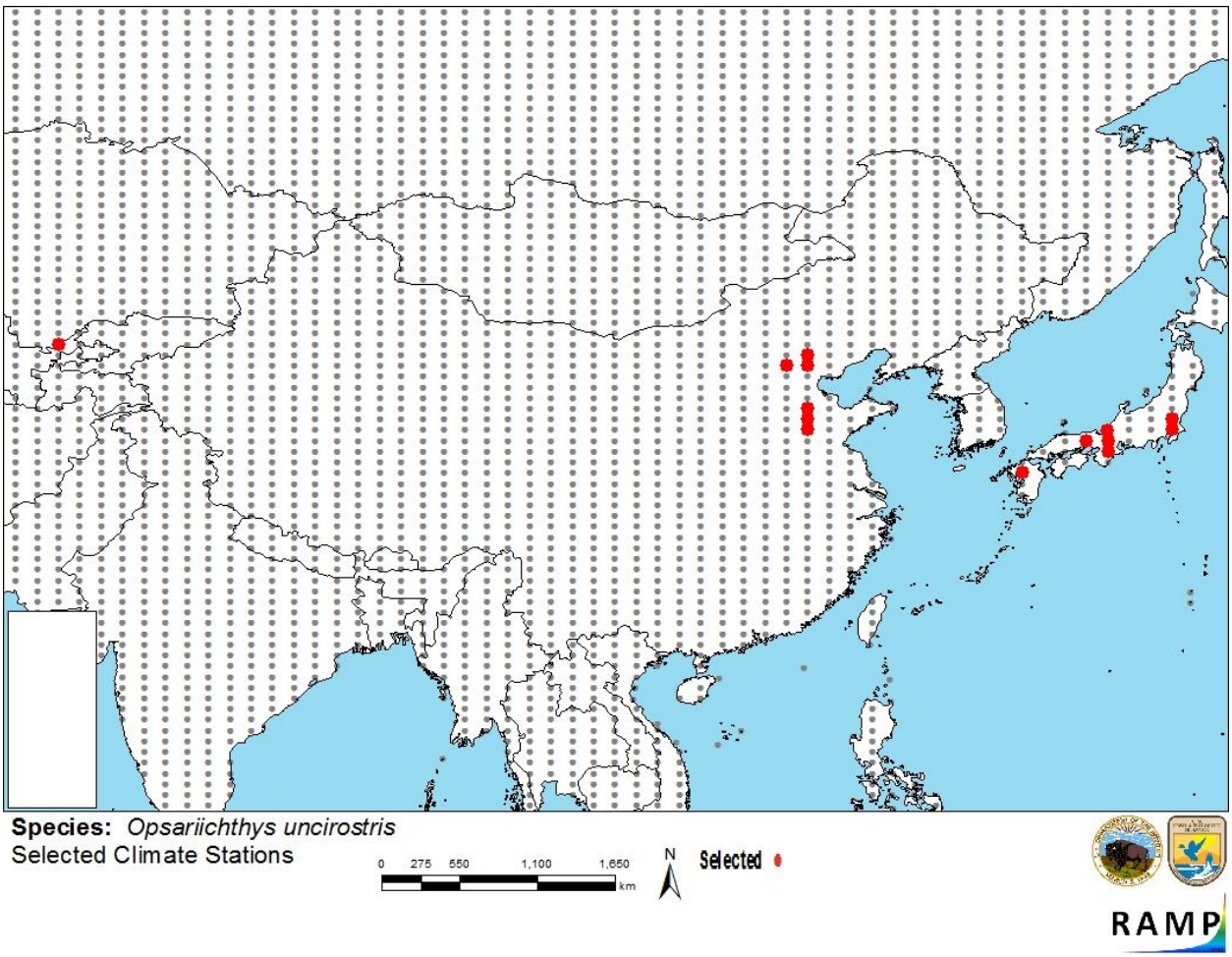

Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red; China, Japan) and non-source locations (gray) for *O. uncirostris* climate matching. Source locations from Kurita et al. (2014), GBIF (2016), and Froese and Pauly (2017).

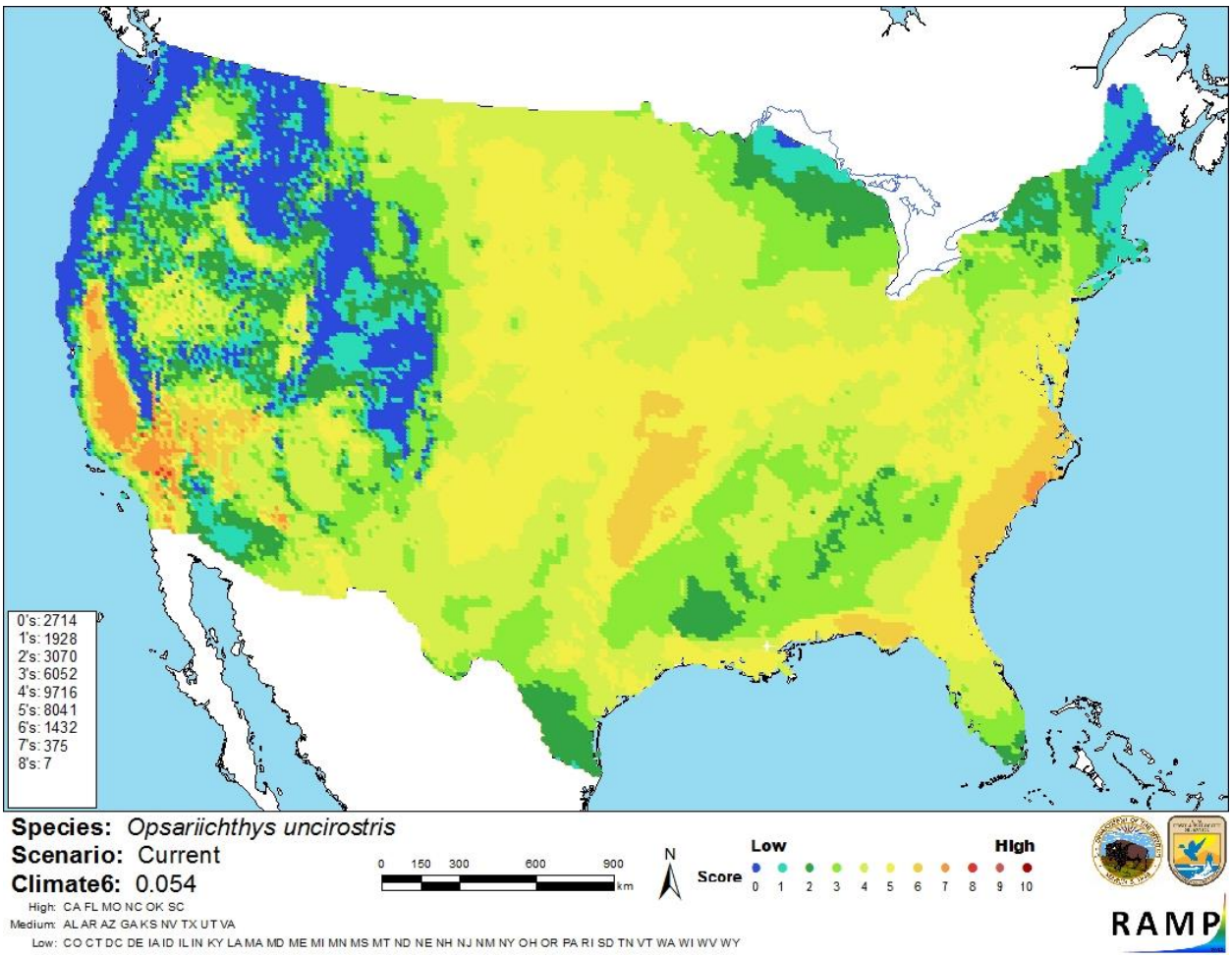

Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *O. uncirostris* in the contiguous United States based on source locations reported by Kurita et al. (2014), GBIF (2016), and Froese and Pauly (2017). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

Information is available on the biology and ecology of *O. uncirostris*. Occurrences of the species are not well documented. Research on impacts of introduction has been sparse, and the most detailed study has occurred in Japan as opposed to locations farther from the native range. Further study is needed to have confidence in the impact to native species. Certainty of this assessment is medium.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Opsariichthys uncirostris is a cyprinid fish native to the Korean Peninsula, northern China, eastern Siberia, and parts of Japan. The species has been introduced to Tashkent, Uzbekistan, and to Kyushu Island, Japan. Introduction typically occurs accidentally through the aquaculture pathway when *O. uncirostris* contaminates shipments of other species. Impacts of introduction are suggested to be detrimental to native species in Uzbekistan, but details are lacking. *O. uncirostris* preys on several native, threatened species on Kyushu Island in Japan, providing evidence of a negative impact of introduction. Climate match to the contiguous U.S. is medium overall, with areas of highest match occurring in central and southern California. Overall risk posed by this species is uncertain.

Assessment Elements

- **History of Invasiveness: High**
- **Climate Match: Medium**
- **Certainty of Assessment: Medium**
- **Overall Risk Assessment Category: High**

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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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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