Roundtail Paradisefish (*Macropodus ocellatus*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, April 2011
Revised, March 2019
Web Version, 3/12/2020

Photo: Andrew Bogott. Licensed under Creative Commons Attribution-Share Alike 4.0 International. Available: https://commons.wikimedia.org/wiki/File:Macropodus_ocellatus.png. (April 2019).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019):

"[In China]: Found between Rivers Zhujiang [Pearl River] and Heilongjiang [River Amur] [Freyhof and Herder 2002]. Collected from Chusan I. and Suzhou in Jiangsu Province [Freyhof and Herder 2002]; and Bosten lake [Walker and Yang 1999]."

"In Amur, historicallly [sic] known only from Sungari [river in China]; […]"

Froese and Pauly (2019) also list *Macropodus ocellatus* as native to South Korea.

Status in the United States
There are no records of *Macropodus ocellatus* in the wild or in trade in the United States.

Means of Introductions in the United States
There are no records of *Macropodus ocellatus* in the wild in the United States.

Remarks
No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing
From Fricke et al. (2019):

"**Current status:** Valid as *Macropodus ocellatus* Cantor 1842."

From ITIS (2019):

Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Anabantoidei
Family Osphronemidae
Subfamily Macropodinae
Genus *Macropodus*
Species *Macropodus ocellatus* Cantor, 1842

Size, Weight, and Age Range
From Froese and Pauly (2019):

"Max length : 6.2 cm SL male/unsexed; [Freyhof and Herder 2002]"

Environment

From Froese and Pauly (2019):

"Freshwater; benthopelagic; pH range: 6.0 - 7.5; dH range: 5 - 25; depth range 0 - ? m. […] 4°C - 25°C [water temperature]"

Climate/Range

From Froese and Pauly (2019):

"Temperate;"

Distribution Outside the United States

Native

From Froese and Pauly (2019):

"[In China]: Found between Rivers Zhujiang [Pearl River] and Heilongjiang [River Amur] [Freyhof and Herder 2002]. Collected from Chusan I. and Suzhou in Jiangsu Province [Freyhof and Herder 2002]; and Bosten lake [Walker and Yang 1999]."

"In Amur, historicallly [sic] known only from Sungari [river in China]; […]"

Froese and Pauly (2019) also list *Macropodus ocellatus* as native to South Korea.

Introduced

From Froese and Pauly (2019):

"Occurrence in the Amur basin [in Russia] is probably the result of introductions [Freyhof and Herder 2002]. […]; reported in 1993 from Khabarovsk [southeastern Russia] [Bogutskaya et al. 2008]."

From NIES (2019):

"Niigata, Ibaraki, Nagano, Aichi, and Okayama Prefs [Japan]. This species was established in wider region in past, but have disappeared in many regions, probably due to urbanization and farm area consolidation."

Means of Introduction Outside the United States

From NIES (2019):

"Privately imported [to Japan] in 1914. In Kanto District, this species was escaped in 1917. In Okayama Pref., this species was released in 1937. By 1970, released in several regions in Honshu Is. The first record in Kasumigaura Lake, Ibaraki Pref., was in 1930."

"Deliberate: Escape of pet animal (in Kanto District [Japan], 1917); Release for biological control of the parasite *Schistosoma japonicum*"

Short Description

From Froese and Pauly (2019):

"Dorsal spines (total): 12 - 19; Dorsal soft rays (total): 5-9; Anal spines: 15-20; Anal soft rays: 7 - 15; Vertebrae: 27 - 29. Caudal fin rounded; lower margin of preorbital weakly serrated, embedded under skin [Masuda et al. 1984]. Stripe crossing eye not connecting spot on posterior projection of opercle with eye; posterior dorsal-fin rays filamentous behind vertical of posterior anal-fin rays in adults; 6-13 gill rakers on ceratobranchial of first arch; posterior tip of margin of scales on body not darker than scales [Freyhof and Herder 2002]."

Biology

From Froese and Pauly (2019):

"Biology similar to *Macropodus opercularis*. Reported to be well-adapted to low winter temperatures (4-25°C); adults and juveniles (about 1.5 cm SL), are sometimes active under ice cover (E. Willems pes.comm. 11/12)."

NIES (2019) lists the habitat as lowland shallow ponds, rice fields, canals irrigation, etc.

Human Uses

From Froese and Pauly (2019):

"Fisheries: of no interest; aquarium: commercial"

From NIES (2019):

"Release for biological control of the parasite *Schistosoma japonicum*"

Diseases

No records of OIE-reportable diseases (OIE 2020) were found. There is no information available regarding diseases in *Macropodus ocellatus*.

Threat to Humans

From Froese and Pauly (2019):

"Harmless"

3 Impacts of Introductions

From NIES (2019):

“Unknown impact [in Japan].”

No information on impacts in the introduced areas of the Amur basin was found.

4 Global Distribution

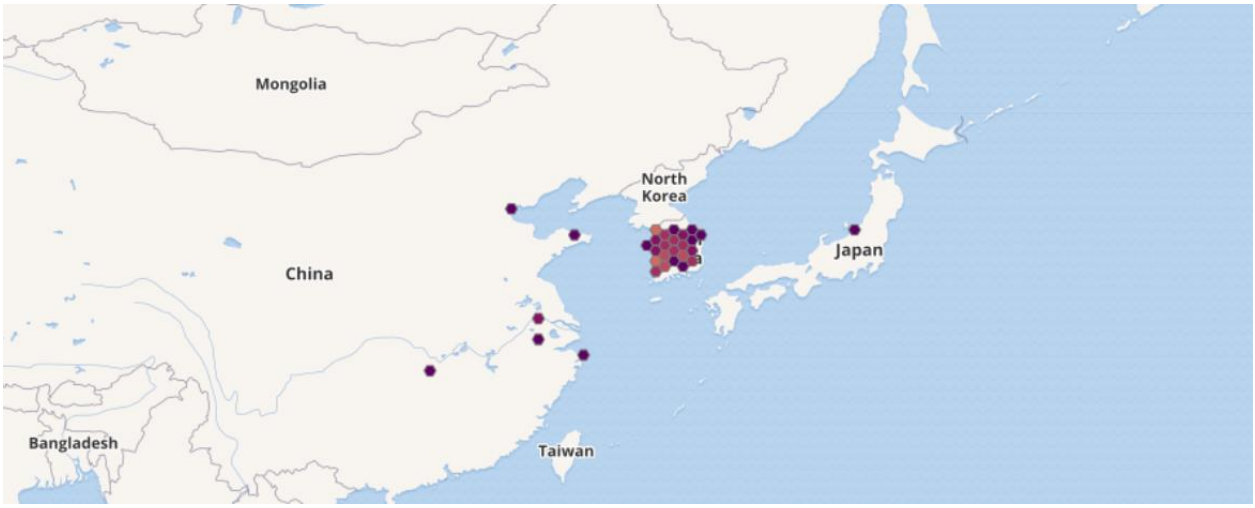

Figure 1. Known global distribution of *Macropodus ocellatus* in China, Korea, and Japan. Map from GBIF Secretariat (2020).

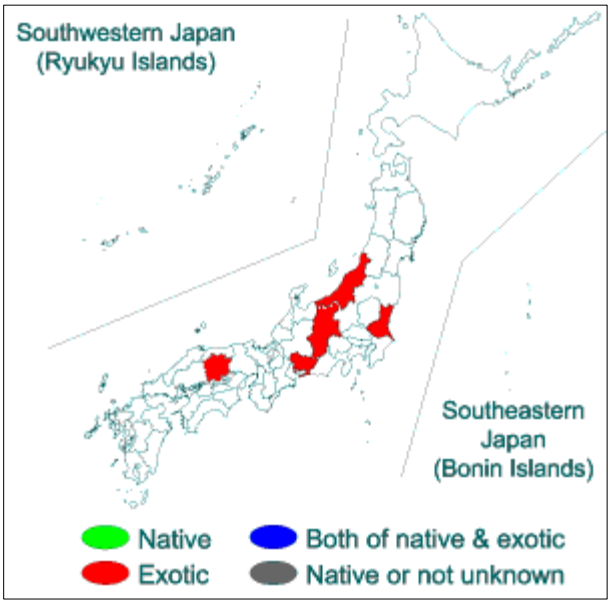

Figure 2. A map of the known distribution of *Macropodus ocellatus* in Japan by prefecture. Map from NIES (2019).

Macropodus ocellatus has been reported from Khabarovsk, Russia (Froese and Pauly 2019). This location was used to select source points for the climate match.

5 Distribution Within the United States

Macropodus ocellatus has not been recorded in the wild in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match for *Macropodus ocellatus* was mostly low to medium. Areas of low match could be found in the western half of the United States and parts of the Northeast and northern Great Lakes. There was an area of high match in northern Minnesota and North Dakota and a small patch of high match located near the southern Appalachian Mountains. Everywhere else had a medium match. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.117, high (scores 0.103 and greater are classified as high). About half the States had low individual climate matches. Arkansas, Delaware, Florida, Georgia, Kansas, Kentucky, Maryland, Minnesota, Missouri, North Carolina, North Dakota, New Jersey, Oklahoma, Pennsylvania, South Carolina, Tennessee, Virginia, Wisconsin, and West Virginia had high individual scores while Alabama, Indiana, New Mexico, Ohio, South Dakota, and Texas had medium individual scores.

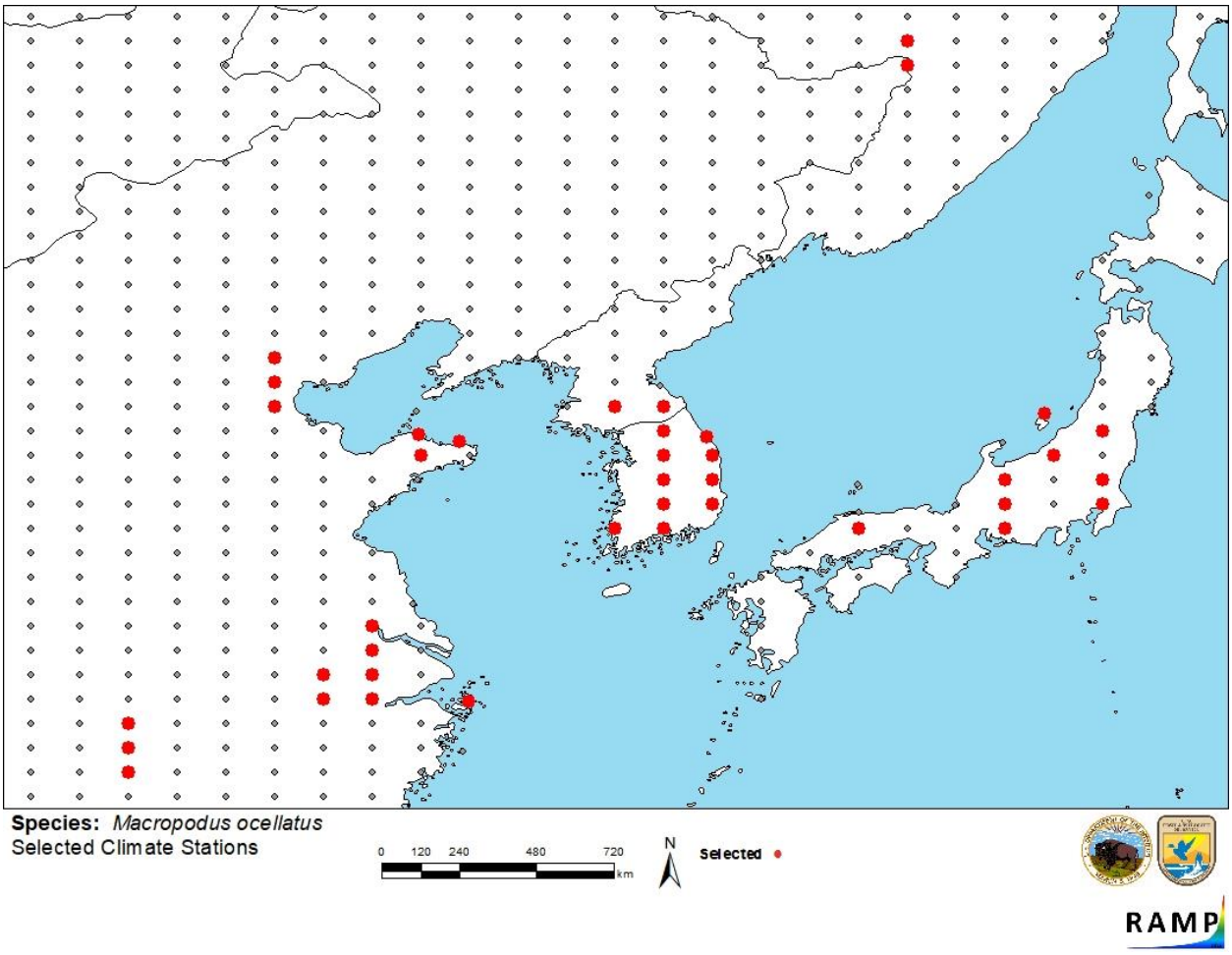

Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in Asia selected as source locations (red; China, Russia, North Korea, South Korea, Japan) and non-source locations (gray) for *Macropodus ocellatus* climate matching. Source locations from GBIF Secretariat (2020). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

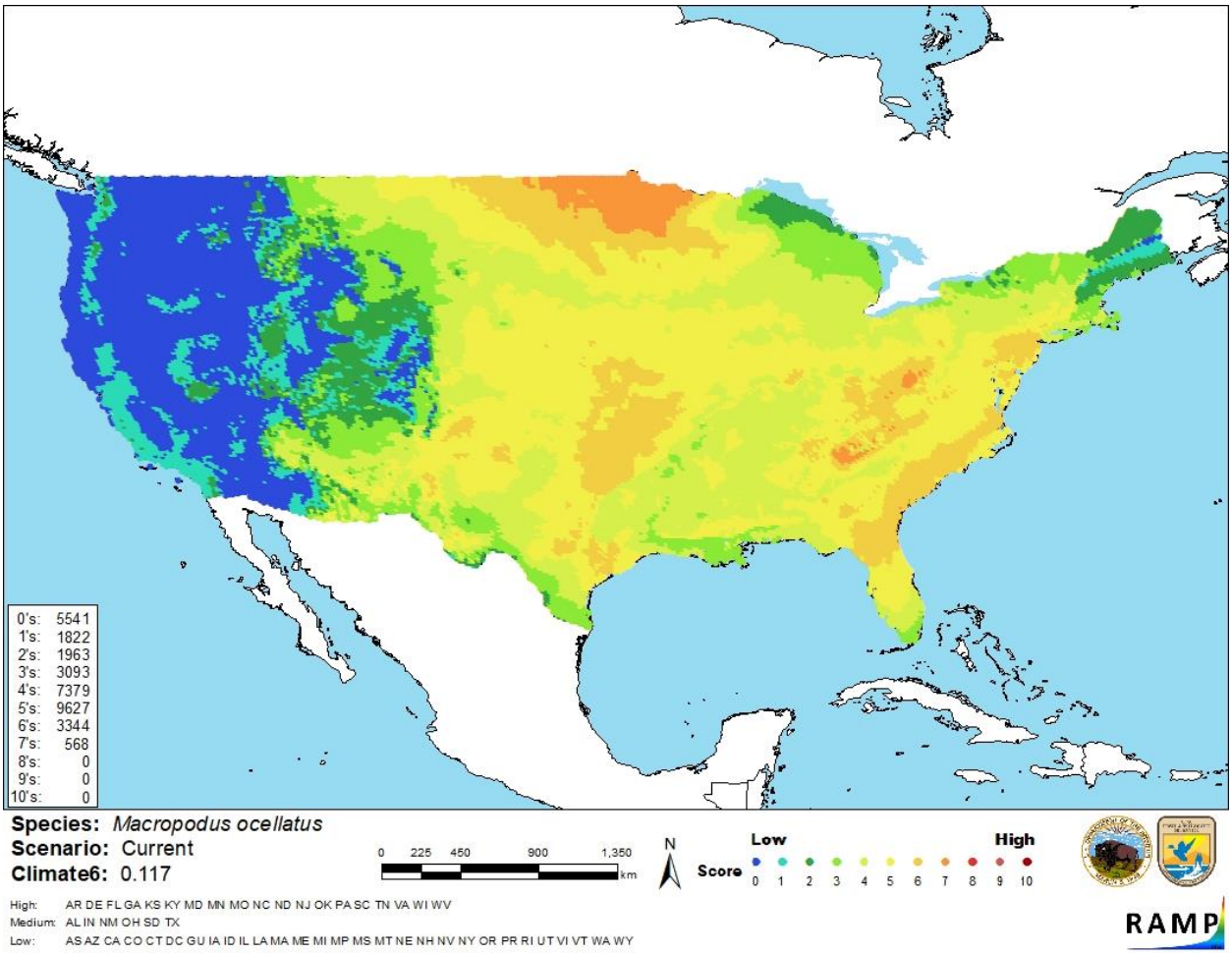

Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Macropodus ocellatus* in the contiguous United States based on source locations reported by GBIF Secretariat (2020). Counts of climate match scores are tabulated on the left. 0 = Lowest match, 10 = Highest match.

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 *Macropodus ocellatus* is low. There was some information on the biology and environment but it was limited. *Macropodus ocellatus* has been recorded as introduced in Japan and eastern Russia but there are no known impacts of its introduction.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Roundtail Parrotfish (*Macropodus ocellatus*) is a fish native to Korea and China. *M. ocellatus* is found in lowland shallow ponds, rice fields, and irrigation canals. *M. ocellatus* is known to survive cold temperatures and has even been recorded as being active under ice cover. The history of invasiveness is None Documented. It has been reported in Japan and Russia, but there is no information available on the impacts its introduction may have had. The climate match for the contiguous United States was high. Most of the contiguous United States had low or medium climate matches with two areas of high match, one in the northern Midwest and the other in the southern Appalachian Mountains. The overall risk assessment category for *Macropodus ocellatus* is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): High**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information: No additional remarks.**
- **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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OIE (World Organisation for Animal Health). 2020. OIE-listed diseases, infections and infestations in force in 2020. Available: http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2020/. (March 2020).

Sanders, S., C. Castiglione, and M. Hoff. 2018. Risk assessment mapping program: RAMP, version 3.1. U.S. Fish and Wildlife Service.

10 References Quoted But Not Accessed

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.

Bogutskaya, N. G., A. M. Naseka, S. V. Shedko, E. D. Vasil'eva, and I. A. Chereshnev. 2008. The fishes of the Amur River: updated check-list and zoogeography. Ichthyological Explorations of Freshwaters 19(4):301–366.

Freyhof, J., and F. Herder. 2002. Review of the paradise fishes of the genus *Macropodus* in Vietnam, with description of two species from Vietnam and southern China (Perciformes: Osphronemidae). Ichthyological Explorations of Freshwaters 13(2):147–167.

Masuda, H., K. Amaoka, C. Araga, T. Uyeno, and T. Yoshino. 1984. The fishes of the Japanese Archipelago, volume 1. Tokai University Press, Tokyo.

Walker, K. F., and H. Z. Yang. 1999. Fish and fisheries in western China. FAO Fisheries Technical Paper 385:237–278.