U.S. Fish & Wildlife Service

Green Chromide Cichlid (*Etroplus suratensis*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, April 2011
Revised, September 2018
Web Version, 6/5/2019

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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

"Western Indian Ocean: India and Sri Lanka."

From Abraham (2011):

"*Etroplus suratensis* is distributed in the coastal regions of peninsular India and Sri Lanka. In India, the wild populations have been recorded from the states of Kerala and Tamil Nadu."

Status in the United States

This species has not been reported as introduced or established in the United States. This species is in trade in the United States.

From Imperial Tropicals (2015):

"Green Chromide Cichlid (*Etroplus suratensis*) […] $ 19.99"

From Bluegrass Aquatics (2019):

"Green Chromide Cichlid – REGULAR
$26.98"

Means of Introductions in the United States

This species has not been reported as introduced or established in the United States.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Acanthopterygii
Order Perciformes
Suborder Labroidei
Family Cichlidae
Genus *Etroplus*
Species *Etroplus suratensis* (Bloch, 1790)"

From Fricke et al. (2018):

"Current status: Valid as *Etroplus suratensis* (Bloch 1790). Cichlidae: Etroplinae."

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length : 40.0 cm TL male/unsexed; [Menon 1999]; common length : 20.0 cm TL male/unsexed; [Pethiyagoda 1991]"

Environment

From Froese and Pauly (2018):

"Brackish; benthopelagic; depth range 10 - ? m. […] 23°C - 26°C [Baensch and Riehl 1985; assumed to be recommended aquarium temperature range];"

From Ng and Tan (2010):

"All locations in Singapore from which *E. suratensis* were collected were brackish-water environments, with salinities ranging between 17·8 and 26·0 and pH 7·0 and 7·9. This is consistent with conditions from which the species is found in its native range in Sri Lanka. The fish has been collected from brackish-water lagoons where the salinity ranges from 0·02 to 28·00 with pH values of 5·0 to 9·6 (Costa, 1983; Samarakoon, 1983). The temperature range recorded during the sampling period was between 29 and 32° C, similar to the temperature range in South Asia of 25–34° C (Costa, 1983)."

Climate/Range

From Froese and Pauly (2018):

"Tropical; […] 11°N - 6°S"

Distribution Outside the United States

Native

From Froese and Pauly (2018):

"Western Indian Ocean: India and Sri Lanka."

From Abraham (2011):

"*Etroplus suratensis* is distributed in the coastal regions of peninsular India and Sri Lanka. In India, the wild populations have been recorded from the states of Kerala and Tamil Nadu."

Introduced

From Abraham (2011):

"There are also populations in Goa, Andhra Pradesh, Orissa and West Bengal [India] (Jayaram 1981 & 2010, Biju 2005). These are likely introduced populations (V.S. Basheer pers. comm.)."

From Ng and Tan (2010):

"*Etroplus suratensis*, a southern Asian cichlid, has established populations in Singapore."

"The species has also been brought into Malaysia (Lever, 1996), where it has established itself in the wild. Introductions into Indonesia and Mauritius have not been successful (Welcomme, 1988)."

"The first collection of *E. suratensis* in the coastal waters of Singapore was one specimen from the SBWR [Sungei Buloh Wetland Reserve] on 11 May 1995. In print, it was recorded that the species was sighted at the SBWR on 6 June 1995 (Lim et al., 1995). In 1997, the fish was collected at Pulau Ubin and in 1999, at the Kallang Basin. Further records indicate that the fish was caught at a few locations along the northern coast of Singapore in 2003, namely Pulau Seletar, Sungei Simpang, Sungei Khatib Bongsu and Sungei Punggol."

"The species has also been collected from freshwater habitats, specifically the Lower Seletar and Kranji Reservoirs, along the northern shoreline."

Means of Introduction Outside the United States

From Ng and Tan (2010):

"Tan & Tan (2003) reported that the species had established itself in Singapore but its mode of introduction to the island has remained unknown."

"The fish could have been introduced into the [Lower Seletar and Kranji] reservoirs via tidal gates that are occasionally opened to release excess water into the sea."

"Fish suppliers (A. Yap, pers. comm.) and officers from the Agri-Food and Veterinary Authority (AVA) of Singapore (Y. K. Poh, pers. comm.) reflected that there are no records of the first import of the fish into the country. Any stocks that were imported for the aquarium trade would have been categorized under Cichlidae (Y. K. Poh, pers. comm.). An ornamental-fish importer provided unofficial information that the species was brought in for the trade in the 1960s (N. Chin, pers. comm.). A check with a major supplier of local shops revealed that they used to import the fish but have ceased to do so recently (A. Yap, pers. comm.)."

"Historical records of the Food and Agriculture Organization (FAO) indicate that *E. suratensis* was introduced into Sabah and Sarawak for aquaculture purposes (Welcomme, 1988; Ang et al., 1989). The Malaysian Fisheries Department (MFD) does not have any past or present records of the species being bred as a food fish in Malaysia (I. Zakaria, pers. comm.)."

Short Description

From Seriously Fish (2018):

"*Etroplus* is the only cichlid genus native to the Indian subcontinent and Sri Lanka and currently comprises three species among which *E. canarensis* is uniquely limited to freshwater and

restricted in range while *E. maculatus* and *E. suratensis* are euryhaline and relatively widespread."

"*E. maculatus* can easily be told apart from the others since dark markings on the body are reduced to 1-3 dark blotches just above midbody (unless stressed when short bars may appear in the upper portion of the body with a solid dark posteroventral patch) and is much paler overall, with the majority of body scales having an orange-red centre."

"The remaining species both possess a series of normally 6 dark vertical bars on the body (excluding those on the head and caudal peduncle) but in *E. canarensis* the anterior 3 bars tend to bifurcate as the fish mature, base body colour is buff-grey, and some body scales have a yellowish central patch, whereas in *E. suratensis* the bars remain solid throughout life, base body colour is greenish-brown, and numerous body scales have a pearly-white central spot."

"*Etroplus* can be told apart from *Paretroplus* by a number of characters including: possession of tricuspid (vs. unicuspid in *Paretroplu*s) teeth; teeth present in multiple rows in both upper and lower jaws (vs. a single row of teeth in upper and lower jaws; teeth numerous in both upper and lower jaws (vs. teeth few in number (< 18 in upper jaw, < 14 in lower); paired anterior gas bladder extensions rather typical and tubelike (vs. paired anterior gas bladder extensions highly-modified with multiple anterior polyplike chambers possessing a tough and thickened tunica externa, and extremely narrow connections (diverticula) to the main gas bladder chamber); an elevated number of anal-fin spines; configuration of the anal-fin pterygiophore/hemal spine complex (Sparks, 2001; Stiassny et al., 2001)."

Biology

From Ng and Tan (2010):

"The variety of food items found in the stomachs of *E. suratensis* conforms to that of the fish in its native range (Prasadam, 1971; Costa, 1983; De Silva et al., 1984), in that it is primarily a macrophyte feeder but also feeds opportunistically on animals."

"Algae was found in stomachs of >90% of *E. suratensis* stomachs across all sizes, making it the most dominant food source of the fish. Animal matter was also found in a high percentage of stomachs."

"In its native range, breeding has been shown to occur when the waters are clear and salinity is high during drier pre-monsoonal and monsoonal seasons (Ward & Samarakoon, 1981; De Silva et al., 1984). The short interval between high salinity periods was the reason that De Silva et al. (1984) concluded that an individual female would not have enough time to undergo a second spawning while it had to guard the previous brood. As the species guards its fry upon hatching, low turbidity is important as it allows the parents to guard their young effectively against predators such as *E. maculatus* (Ward & Samarakoon, 1981) that shares the habitat in Sri Lanka but not in Singapore."

"The lowest estimate of fecundity of mature female *E. suratensis* (300 eggs per female) was less than that of the number in Sri Lanka (600 eggs per female) as calculated by Costa (1983). The

uppermost number (2600 eggs per female) was within the range of the count done in Sri Lanka (maximum = 3900 eggs per female). The correlation between fecundity and L_S length of *E. suratensis* was weak. The study by Costa (1983) concluded that there was no correlation between fecundity and L_S, but no statistical analysis was conducted."

Human Uses

From Froese and Pauly (2018):

"Fisheries: commercial; aquaculture: commercial; aquarium: commercial"

From Abraham (2011):

"*Etroplus suratensis* is a popular foodfish. It is known locally as Karimeen and is considered a delicacy. The species has been introduced to various other man-made habitats like tanks, ponds and dam reservoirs for culture and export."

From Ng and Tan (2010):

"There also appears to be cases of locals [in Singapore] who collect *E. suratensis* from surrounding waters and sell the fish to suppliers (R. Azmi, pers. comm.)."

This species is in trade in the United States. For example:

From Imperial Tropicals (2015):

"Green Chromide Cichlid (*Etroplus suratensis*) […] $ 19.99"

From Bluegrass Aquatics (2019):

"Green Chromide Cichlid – REGULAR
$26.98"

Diseases

From Pathiratne et al. (1994):

"During natural outbreaks of the disease, in 1990-1991, clinical signs of EUS were observed in *Etroplus maculatus, Etroplus swatensis, Glossogobius* sp., *Ophicephalus punctatus, Ophicephalus striatus, Puntius* sp., *Tor khudree longispinnis, Rasbora danicornius, Trichogaster pectoralis, Anabus testudineus* and *Wallago attu*. Fish showed haemorrhagic lesions and/or ulcers with varying degrees of necrosis in various regions of the body. Some displayed haemorrhagic and eroded fins. A total of 64 bacterial isolates were obtained from the 22 fish examined. *Aeromonas hydrophila* was the predominant species (69 %) recovered from all EUS-affected fish examined, regardless of the extent of the lesion or the habitat from which the fish was collected."

OIE (2018) lists “Infection with *Aphanomyces invadans* (epizootic ulcerative syndrome)” in “OIE-Listed diseases, infections and infestations in force in 2018”.

Threat to Humans

From Froese and Pauly (2018):

“Harmless”

3 Impacts of Introductions

From Ng and Tan (2010):

“Dietary analysis of the stomachs of other introduced cichlids that were found in the same habitats of *E. suratensis* points to possible resource competition between the target species and the non-native tilapias. Further work incorporating measures of resource availability would provide better evidence of niche overlap and interspecies competition. As the SBWR [Sungei Buloh Wetland Reserve, Singapore] is an important site for conservation and public education, the feral populations of *E. suratensis* within Singapore need to be more closely monitored and investigated.”

4 Global Distribution

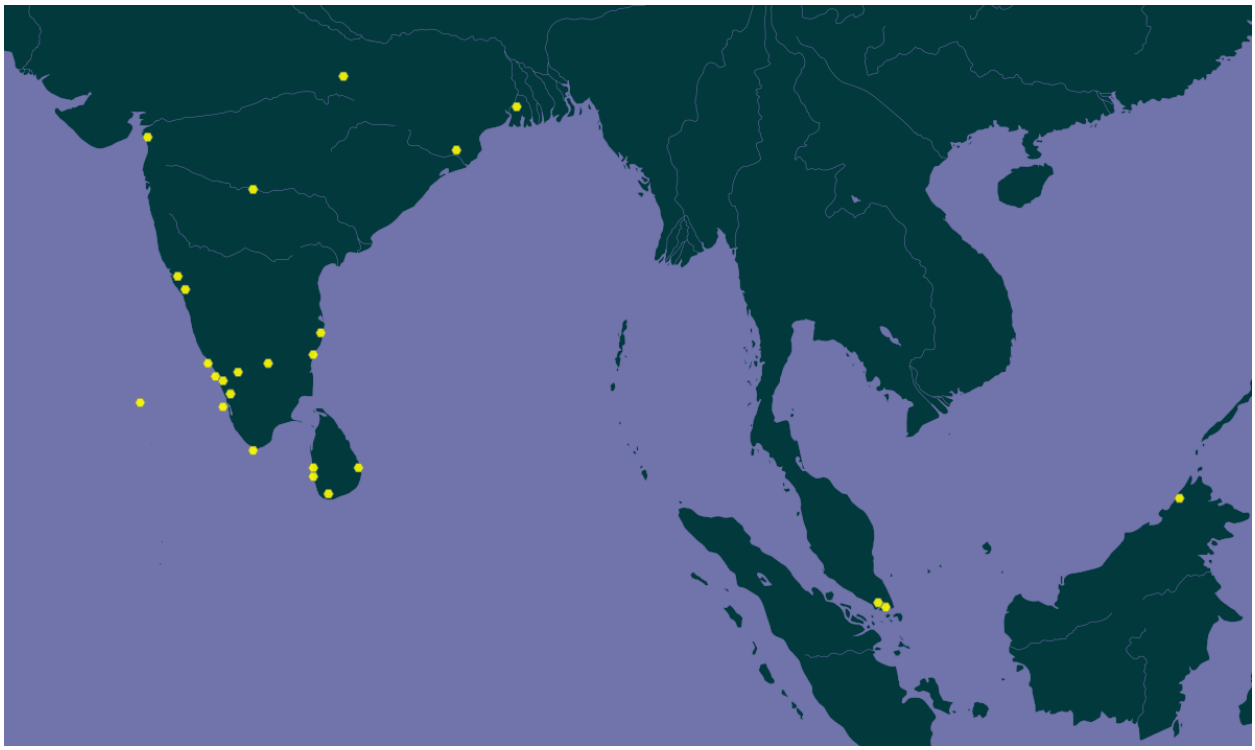

Figure 1. Known global distribution of *Etroplus suratensis*, reported from southern Asia. Map from GBIF Secretariat (2018). A point off the coast of India was excluded as an outlier because of imprecise coordinates.

5 Distribution Within the United States

This species has not been reported as introduced or established outside of its native range.

6 Climate Matching

Summary of Climate Matching Analysis

The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous U.S. was 0.0, which is a low climate match. A Climate 6 score of 0.005 or below indicates a low climate match. The climate match was low in every state in the contiguous United States except for Florida, where the climate match was medium. There was also a small area of medium climate match in Southern Texas.

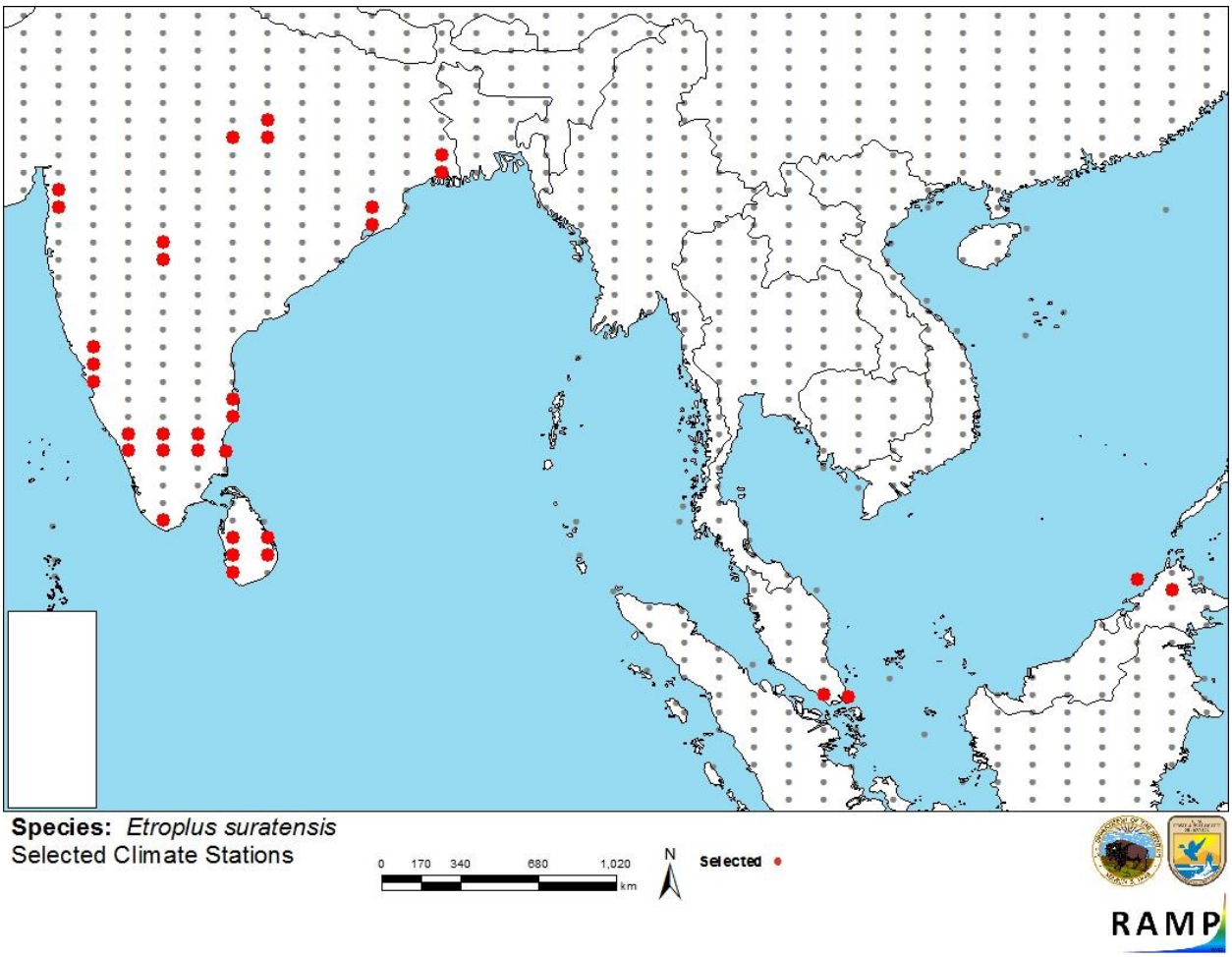

Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations in southern Asia selected as source locations (red; India, Sri Lanka, Singapore, and Malaysia) and non-source locations (gray) for *Etroplus suratensis* climate matching. Source locations from GBIF Secretariat (2018).

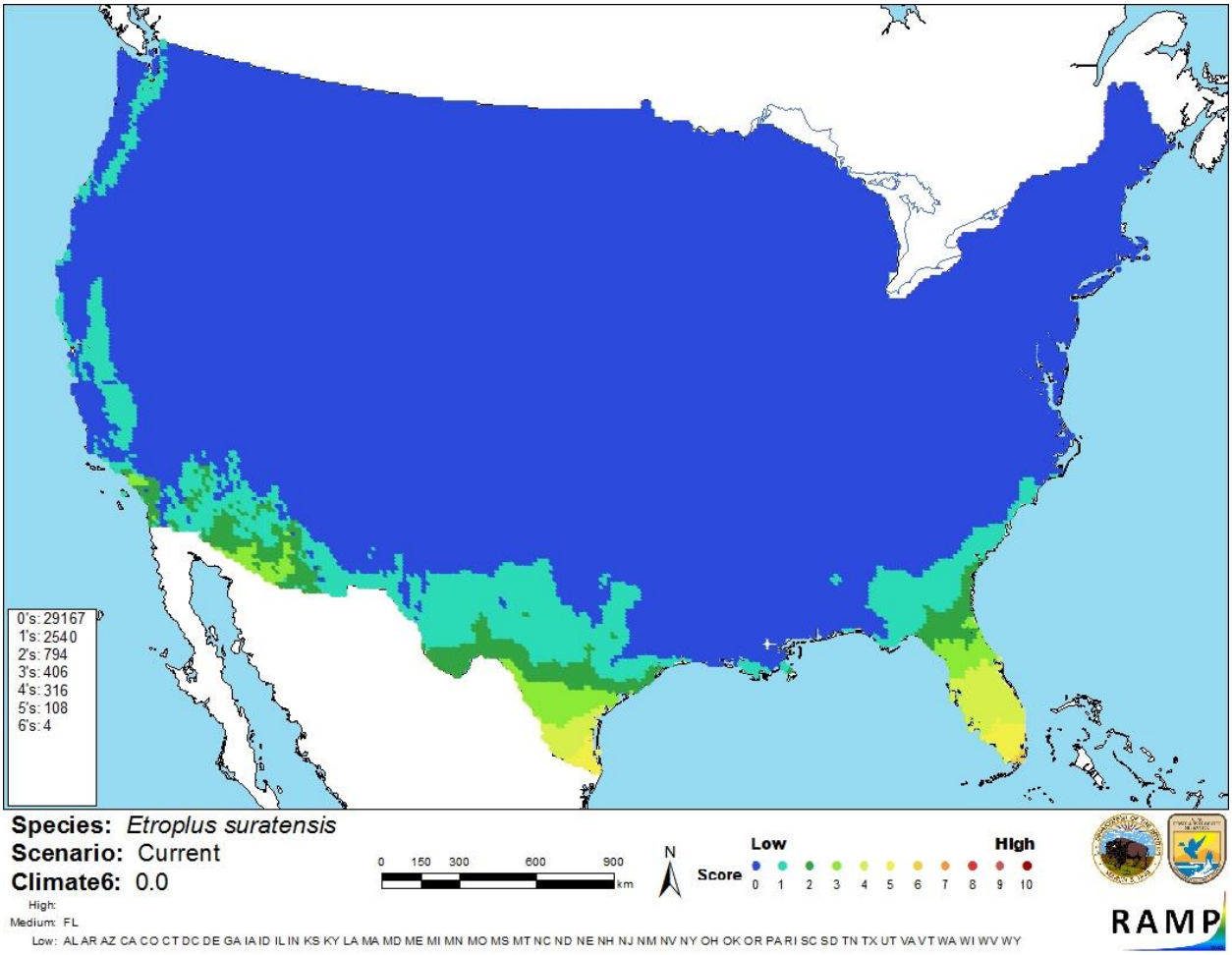

Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Etroplus suratensis* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). Counts of climate match scores are tabulated on the left. 0= Lowest match, 10= Highest match.

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

There is adequate information available about the biology of *Etroplus suratensis*. It has been reported as introduced outside of its native range, but no research is available assessing impacts of this species outside of its native range. Further information is needed to adequately assess the risk this species poses to the contiguous United States. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Etroplus suratensis, the Green Chromide, is a cichlid species native to Sri Lanka and coastal India. This species has been introduced to Singapore and Malaysia, but no studies are available that assess the negative impacts of these introductions. *E. suratensis* is in trade in the United States, but no introductions of this species in the U.S. have been documented. This species has a low climate match with the contiguous U.S. overall, and it has a medium climate match in Florida. The certainty of this assessment is low because of a lack of information from which to assess the risk this species poses to the contiguous U.S. The overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Low**
- **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

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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