



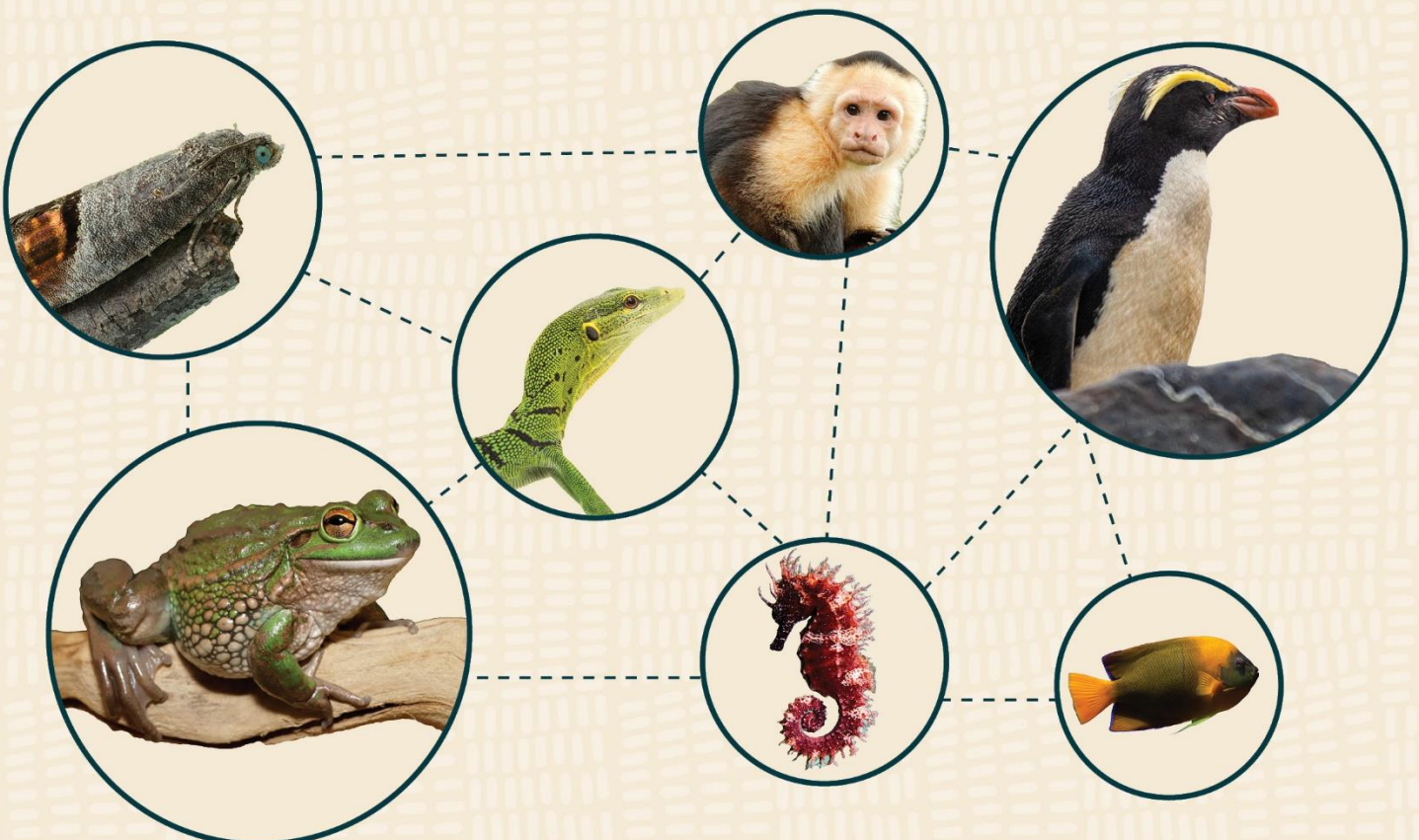
Australian Government

Department of Climate Change, Energy,  
the Environment and Water

# Assessment of the relevant impacts of *Kryptopterus vitreolus* on the Environment (Assessment Report)

Consideration of an amendment under the *Environment Protection and Biodiversity Conservation Act 1999* List of Specimens taken to be Suitable for Live Import

July 2023



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# 1 Introduction

## Purpose of proposed amendments

The Australian Government Department of Climate Change, Energy, the Environment and Water (the department) proposes to amend the List of Specimens Taken to be Suitable for Live Import (Live Import List) to:

1. include *Kryptopterus vitreolus*, known by some as a glass catfish, and
2. remove *Kryptopterus bicirrhis*, which is known as the glass catfish.

The department has recently become aware that the commonly traded glass catfish which appears on the Live Import List has been misidentified. The species imported into Australia (and around the world) is a previously unnamed species which has been globally misidentified for over 80 years before being identified as *Kryptopterus vitreolus*. The species on the Live Import List with the common name glass catfish (*Kryptopterus bicirrhis*) is not imported or common in the aquarium industry. The department proposes to include *Kryptopterus vitreolus* on the Live Import List. The department's objective is to enable legal imports of the species *Kryptopterus vitreolus* into Australia under its correct taxonomical name.

## 2 Background

Under s303EC of the EPBC Act, the Minister may amend the Live Import List by including a specimen in the list. There are two parts to the list—Part 1 comprises specimens that can be imported without a permit under the Act and Part 2 comprises specimens, including CITES species, that require a permit under the Act to be imported. Import restrictions may be applied to the species listed on Part 2, such as ‘for non-commercial purposes’ or ‘high security facilities only’. Additional conditions may also be applied when an import permit is issued.

Before amending the Live Import List, the Minister must consult with other Ministers as the Minister considers appropriate and may consult such other persons and organisations as the Minister considers appropriate and consider a report assessing the potential environmental impacts of the proposed amendment. The department carries out this consultation process on behalf of the Minister and considers all comments and information received when producing the assessment report for the Minister’s consideration.

### Taxonomy

<b>Kingdom:</b>	Animalia
<b>Phylum:</b>	Chordata
<b>Class:</b>	Actinopterygii
<b>Order:</b>	Siluriformes
<b>Family:</b>	Siluridae
<b>Genus:</b>	Kryptopterus
<b>Species:</b>	vitreolus

The naming authority is Ng and Kottelat, 2013.

### 2.1 Listing concerns

*Kryptopterus vitreolus* is widely and freely traded within Australia from specimens imported into Australia under the listing of *Kryptopterus bicirrhis*. This amendment is primarily to include on the Live Import List the traded specimen with its correct taxonomical name as this species has been misidentified in scientific literature for over 80 years (Ng and Kottelat, 2013).

There are two glass catfish listed on the Live Import List, *Kryptopterus bicirrhis* (glass catfish) and *Kryptopterus macrocephalus* (poormans or striped glass catfish). Following the identification of *K. vitreolus* as the traded species it appears that *K. bicirrhis* has never been imported nor is it of interest to the aquarium industry. It is understood that the glassfish imported to date have been *K. vitreolus*; to allow further imports of this fish requires an amendment to the Live Import List.

This also highlights the issue of several species sharing the same common name and imports relying on common names rather than scientific names.

## 3 Description

The glass catfish *Kryptopterus vitreolus* (Ng and Kottelat, 2013) is an Asian glass catfish found in Thailand. It is commonly known as 'glass catfish', 'Asian glass catfish', 'ghost catfish' and 'phantom glass catfish'. The average size of adult fish is about 8-10 cm total length (Ng and Kottelat, 2019). It has a small head with a slightly bowed tail and an elongated body. It has a scale-less and translucent body, in which the organs can be observed from the outside towards the anterior end of the fish. The fish has two pairs of long barbels; the first pair is long and connected to the upper jaw, while the second pair is shorter and connected to the mandible. A small dorsal fin is almost invisible; however, the anal fin is long and connects to the caudal fin (Ng and Kottelat, 2019).

The species currently on the Live Import List, *K. bicirrhis*, is unlikely to have been imported as it is a larger fish, reaching a standard length of 15 cm, is a grey opaque colour, and not transparent (Ng and Kottelat, 2013). In a review of aquarium literature conducted by Ng and Kottelat, 2013, it was found that, upon examination of photos published in various articles, most, if not all, fish exported for the aquarium trade are *K. vitreolus* not *K. bicirrhis*. This is further supported by Aquarium fish websites (planetcatfish, seriouslyfish, fishkeeping world).



### 3.1 Conservation status

*Kryptopterus vitreolus* is listed on the IUCN Red List as 'Least Concern'. They are not listed on the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) appendices.

*K. vitreolus* is abundant in the wild, therefore breeding strategies are not well established as all the fish in the aquarium trade are wild captured. However, research is taking place to develop a strategy for breeding *K. vitreolus* in captivity to cope with the threats of over exploitation (Ng and Kottelat, 2019).

### **3.2 Distribution, Habitat and Biology of *Kryptopterus vitreolus***

*Kryptopterus vitreolus* is found in the short, coastal drainages in peninsular Thailand into the Gulf of Thailand, as well as similar rivers draining the south-eastern face of the Cardamom Mountains in south-eastern Thailand. This species is also reported to come from the vicinity of Penang, but this record requires verification (Ng and Kottelat, 2013). *K. vitreolus* sourced for the aquarium trade are primarily taken from Phattalung Province (Ng and Kottelat, 2019).

*K. vitreolus* has been observed in slow moving to standing, brown to black, water. In the aquaria this species is considered difficult to keep due to the sensitivities it has to water quality, temperature and pH. In aquaria they are reported to be picky eaters with a preference for live food over flake, they are however known to be weaned to flake over time.

*K. vitreolus* is a schooling fish usually found in groups that can number 100 or more, all facing the current in the same direction. When they are scared, they scatter and then return to schooling again. Males and females look very similar with males being typically smaller. Females can be identified by large abdomens and red sex papillae (Ng and Kottelat, 2019).

## 4 Risk assessment

Assessing the risk of the potential of introducing a new organism into the environment involves assessing the risk of it becoming established and spreading and the likely impacts if establishment occurred.

Bomford (2008) found that for freshwater fish, the level of risk can be assumed in accordance with the four key factors of establishment success. These factors are:

- Propagule pressure—the release of large numbers of animals at different times and places enhances the chance of successful establishment
- Climate match—introduction to an area with a climate that closely matches that of the species' original range
- History of establishment elsewhere—previous successful establishment
- Taxonomic group—belonging to a family or genus which has a high establishment success rate.

### 4.1 Risk of establishment

#### 4.1.1 Propagule pressure—the release of large numbers of animals at different times and places

*Kryptopterus vitreolus* is a schooling species which means that has a higher likelihood to establish than non-schooling species. However, the species is not territorial, and any releases would disperse through the water way. To establish a self-sustaining population would require deliberate actions by a knowledgeable individual into very specific waterways in remote locations and is highly unlikely to occur at random.

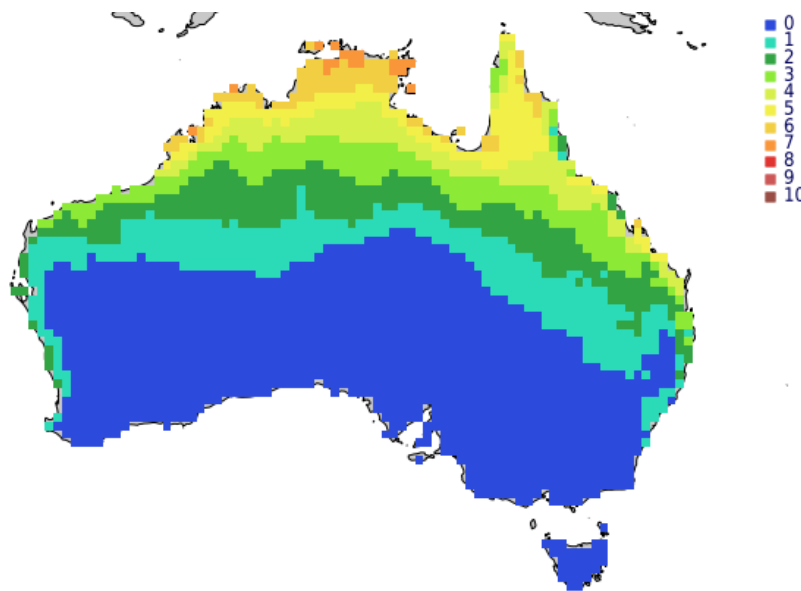
The possible locations where establishment may occur are generally remote from populated areas, this includes areas in Arnhem Land and far Northern Australia. It is very unlikely that enough fish would be released into a suitable receiving environment to establish a breeding population as a result of an accident or being deliberately released into the local waterways.

#### 4.1.2 Climate match—introduction to an area with a climate that closely matches that of the species' original range

The climate match used by Bomford (2008) is based on terrestrial measurements and therefore does not accurately represent suitable aquatic ranges for the species in Australia. Climatch was used to assist in identifying possible suitable habitat in Australia that the species could inhabit if released. Climatch is based on terrestrial climate data and the target species is a freshwater fish therefore it is not a completely accurate indicator of possible inhabitation. The output of the risk assessment shows the species could probably only inhabit far northern Australia with no areas scoring above 7 out of 10 in compatibility. Northern Australia was most climatically suited to the species where water temperatures are between 22 - 28° C, the water is brackish with salinity changing with the tides, and soft water is present. *Kryptopterus vitreolus* is suited to soft water and is known not to survive in the hobby aquarium unless strict conditions are met in relation to water parameters and water quality. *K. vitreolus* is not known to thrive in brackish water in the aquaria. Climatch results suggests that



there are no areas strongly suited to *K. vitreolus*, suggesting that it is unlikely to establish in Australian waters.



#### 4.1.3 History of establishment elsewhere—previous successful establishment

There is no evidence that, despite being actively traded in Australia for several decades, the species has established any wild populations. The species is found in three specific locations in Thailand and has not colonised all of Thailand's peninsula where the species is endemic, which suggests the species has limited environmental plasticity.

There are no reports of this species establishing in any country or outside its limited range in Thailand, therefore its establishment potential should be considered very low.

#### 4.1.4 Taxonomic group—belonging to a family or genus which has a high establishment success rate

*Kryptopterus vitreolus* is a member of the Siluridae family, which has 107 species and 28 genera (Frose and Pauly, 2020). None of the 28 members of the *Kryptopterus* genera are considered invasive. Fish Base notes that three members of the *Kryptopterus* genus, namely *K. sabanus*, *K. palembangensis* and *K. bicirrhis*, have been introduced into the Philippines, which is outside their native range, and for all three the outcome of establishment and any impacts is unknown. For this risk assessment we have assumed the worst-case scenario which is for each of the three introductions the species has established.

There are no records of *K. vitreolus* establishing feral populations anywhere despite being a common aquarium fish worldwide and traded since the 1930s. Given the lack of evidence of any members of the *Kryptopterus* genus establishing in areas outside their native range, the department does not consider *K. vitreolus* a high-risk species in terms of the establishment of feral populations.

#### 4.1.5 Potential impacts of established feral populations

*Kryptopterus vitreolus* is a schooling nonaggressive fish that is not reported to be territorial. If a population did manage to become established in the wild in Australia it may compete for food resources with native fish, this would include small invertebrates and zooplankton. As there are no reports of any *Kryptopterus* species establishing feral populations direct impacts are unknown.

This report has determined that *K. vitreolus* only poses a minor risk to the Australian environment as they have been freely traded in Australia for many years, with the species traded worldwide since the 1930s with no evidence of establishment of feral populations or any detrimental impact in any other country.

## 4.2 Other risks

### 4.2.1 Disease transmission to Australian fish and aquarium fish populations

The import of *Kryptopterus vitreolus* will need to undergo an import risk analysis under the Biosecurity Act 2015 by the Department of Agriculture, Water and the Environment. This will assess the disease and pathogen risks of the importation of the species.

*K. vitreolus* are commonly traded in Australia. The greater environmental disease risk is probably from pre-existing diseases in Australian aquarium populations being transferred to wild fish or aquatic environments. Importation of *K. vitreolus* is unlikely to change this risk rating.

### 4.2.2 Theft and deliberate release

*Kryptopterus vitreolus* are reasonably cheap (\$10 - 20 per fish) and freely available in Australia through aquarium stores. *K. vitreolus* is common enough in Australia that theft due to lack of availability is unlikely.

Only a very deliberate and planned release might result in establishment of *K. vitreolus*. Although a lack of possible suitable habitats and their remoteness from populated areas makes this scenario highly unlikely.

### 4.2.3 Exotic Freshwater Fish Risk Assessment Model (Bomford 2008)

#### Species identification and sources

#### Glass Catfish

Common name	No accepted common name but at times called 'glass catfish'
Scientific name	<i>Kryptopterus vitreolus</i>
Date assessed	18 August 2020
Literature Search Type and Date:	FishBase August 2020

<b>Scores</b>	<b>Value</b>	<b>Explanation</b>
A. Climate Match Score (1–8)	3	Euclidian score level 3 = 96 or a score of 3.
B. Overseas Range Score (0–4)	0	Inhabits 40 000 square km
C. Establishment Score (0–3)	1	Never introduced or established.
D. Introduction Success Score (0–4)	2	Never known to be released or established. However, after decades of trade worldwide it can be assumed it has been released into non-native areas.
E. Taxa Risk Score (0–5)	1	Three members of the family introduced outside of native range. Outcome unknown.

<b>Summary</b>	<b>Score</b>	<b>Rank</b>
Establishment Risk	7	Low

Source: Department of Climate Change, Energy, the Environment and Water

## 5 Conclusion

The listing of the glass catfish on Part 1 of the Live Import List should be amended to add *Kryptopterus vitreolus* (glass catfish), a species which is regularly imported into Australia.

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