

# Dwarf Gourami (*Trichogaster lalius*)

## Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, April 2016  
Revised, February 2017, August 2017  
Web Version, 6/25/2018



Photo: Quatermass. Released to Public Domain. Available:  
[https://commons.wikimedia.org/wiki/File:Colisa\\_lalia.jpg](https://commons.wikimedia.org/wiki/File:Colisa_lalia.jpg).

## 1 Native Range and Status in the United States

---

### Native Range

From Vishwanath (2010):

“*Trichogaster lalius* is widely distributed in India (lowland Ganges and Brahmaputra basins), Pakistan (rare), Bangladesh, and Nepal.”

From Nico (2016):

“Tropical Asia. India, Pakistan, Bangladesh, and possibly Borneo (Jayaram 1981; Talwar and Jhingran 1992).”

## Status in the United States

From Nico (2016):

“Collected in Lake Worth Drainage District canal L-15, west of Atlantis and Lantana, adjacent to a fish farm in Palm Beach County, Florida, in 1969 and 1970 (Ogilvie 1969; Courtenay et al. 1974; Courtenay and Hensley 1979). Taken from several sites in Hillsborough County including a canal east of Ruskin in 1971 (Courtenay et al. 1974; Courtenay and Hensley 1979); Bullfrog Creek at U.S. 301, east of Ruskin, on 24 Mar 1971 (museum specimens); a canal adjacent to a fish farm in Ruskin, in 1978 (Courtenay and Hensley 1979); a drainage ditch west of U.S. 41 in Ruskin, on 26 Oct 1979 (museum specimens); and from a ditch adjacent to the Tampa Bypass Canal in November 1993 (museum specimens).”

“Reported from two regions in Florida. No known reproduction.”

From FAO (2016a):

“*Trichogaster lalia* introduced to United States of America from Southeast Asia”

From FAO (2016b):

“*Colisa lalia* introduced to United States of America from unknown. Status of introduced species in the wild: Probably established.”

## Means of Introductions in the United States

From Nico (2016):

“Probable release or escape from fish farms.”

## Remarks

A recent taxonomic change placed this species back within the genus *Trichogaster* and made genus *Colisa* obsolete (Vishwanath 2010). This created some taxonomic confusion and information searches were performed using synonyms *Trichogaster lalius* and *Colisa lalia*.

## 2 Biology and Ecology

---

### Taxonomic Hierarchy and Taxonomic Standing

According to Eschmeyer (2017), *Trichogaster lalius* (Hamilton 1822) is the valid name for this species. It was originally described as *Trichopodus lalius* Hamilton 1822 and it has been previously known as *Polyacanthis lalius*, and *Colisa lalia*.

From ITIS (2016):

“Kingdom Animalia  
Subkingdom Bilateria  
Infrakingdom Deuterostomia  
Phylum Chordata  
Subphylum Vertebrata  
Infraphylum Gnathostomata  
Superclass Osteichthyes  
Class Actinopterygii  
Subclass Neopterygii  
Infraclass Teleostei  
Superorder Acanthopterygii  
Order Perciformes  
Suborder Anabantoidei  
Family Osphronemidae  
Subfamily Luciocephalinae  
Genus *Colisa*  
Species *Colisa lalia* (Hamilton, 1822)”

## **Size, Weight, and Age Range**

From Nico (2016):

“Size: 5-8 cm SL.”

From Froese and Pauly (2016):

“Max length: 8.8 cm TL male/unsexed; [Rahman 1989]”

## **Environment**

From Froese and Pauly (2016):

“Freshwater; benthopelagic; pH range: 6.0 - 8.0; dH range: 5 - 19. [...]; 25°C - 28°C [assumed to be recommended aquarium temperature] [Baensch and Riehl 1985]”

## **Climate/Range**

From Froese and Pauly (2016):

“Tropical; [...]”

## **Distribution Outside the United States**

### **Native**

From Vishwanath (2010):

“*Trichogaster lalius* is widely distributed in India (lowland Ganges and Brahmaputra basins), Pakistan (rare), Bangladesh, and Nepal.”

From Nico (2016):

“Tropical Asia. India, Pakistan, Bangladesh, and possibly Borneo (Jayaram 1981; Talwar and Jhingran 1992).”

### **Introduced**

From Froese and Pauly (2016):

“This is the smallest and most popular of the small gouramis which have been widely distributed outside its native range [Welcomme 1988].”

According to Froese and Pauly (2016), *Trichogaster lalius* has been introduced and become established in Taiwan and Colombia; it was introduced and did not become established in Singapore; and it was introduced with unknown result in Canada and the Philippines.

From FAO (2016a):

“*Trichogaster lalia* introduced to Colombia from unknown.”  
“Status of the introduced species in the wild: Established”

From FAO (2016b):

“*Colisa lalia* introduced to Singapore from unknown.”  
“Status of the introduced species in the wild: Not established”

“*Colisa lalia* introduced to Colombia from unknown.”  
“Status of the introduced species in the wild: Probably established”

“*Colisa lalia* introduced to Canada from unknown.”  
“Status of the introduced species in the wild: Unknown”

“*Colisa lalia* introduced to Singapore from unknown.”  
“Status of the introduced species in the wild: Established”

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

From FAO (2016b):

“Reasons of Introduction: 1) ornamental”

## Short Description

From Dorn (1916):

“The principle color extending over the body of the male, excepting the fins and tail, is steel blue, with irregular orange zigzag bands running vertically. The fins and tail (except the pectoral fins) are orange, mottled with a great number of red spots the size of a pin-head, the edges of the fins are blue with bright red tips. During the mating and breeding seasons these already bright colors are greatly intensified. The pale orange becomes redder and the blue throat a most brilliant dark steel blue.”

## Biology

From Froese and Pauly (2016):

“Male guards the floating bubble-nest where the eggs are laid, about 600 in number. Hatching takes place in 12 to 24 hours while the male parent continues to protect the nest. In about three days, the developing larvae become free-swimming and leave the nest.”

From Vishwanath (2010):

“Most of the species are known from slow moving streams, rivulets and lakes with plenty of vegetation. Also from rice fields, irrigation channels and other agricultural lands.”

## Human Uses

From Vishwanath (2010):

“These lovely little fishes are often sold alive in bottles of water at Calcutta and they thrive well in an aquarium. It attains 5 cm. in length. It is smallest of the genus and certainly one of the most beautiful. A highly satisfactory and interesting aquarium fish. The species is used for food at the subsistence level.”

From Papavlasopoulou et al. (2014):

“Table 1. Ornamental fish species with >50% frequency of presence in Hellenic aquarium stores and retail prices. [...] *Trichoagaster lalius* [...]”

## Diseases

**No records of OIE reportable diseases were found.**

From Froese and Pauly (2016):

“Fin-rot Disease (late stage), Bacterial diseases  
Costia Disease, Parasitic infestations (protozoa, worms, etc.)  
Skin Flukes, Parasitic infestations (protozoa, worms, etc.)  
Fin Rot (early stage), Bacterial diseases

False Fungal Infection (*Apiosoma* sp.), Parasitic infestations (protozoa, worms, etc.)  
False Fungal Infection (*Epistylis* sp.), Parasitic infestations (protozoa, worms, etc.)  
Bacterial Infections (general), Bacterial diseases  
Tetrahymena Disease, Parasitic infestations (protozoa, worms, etc.)  
Fish tuberculosis (FishMB), Bacterial diseases  
Egg Bound Disease, Others”

Rimmer et al. (2016) states that *Trichogaster lalius* can be infected with dwarf gourami iridovirus (DGIV).

## Threat to Humans

From Froese and Pauly (2016):

“Harmless”

## 3 Impacts of Introductions

---

From Nico (2016):

“Unknown.”

“This species has been shown to be an alternative host to the glochidia of native unionid mussels *Lampsilis cardium* and *Utterbackia imbecillis* (Watters and O'Dee 1998).”

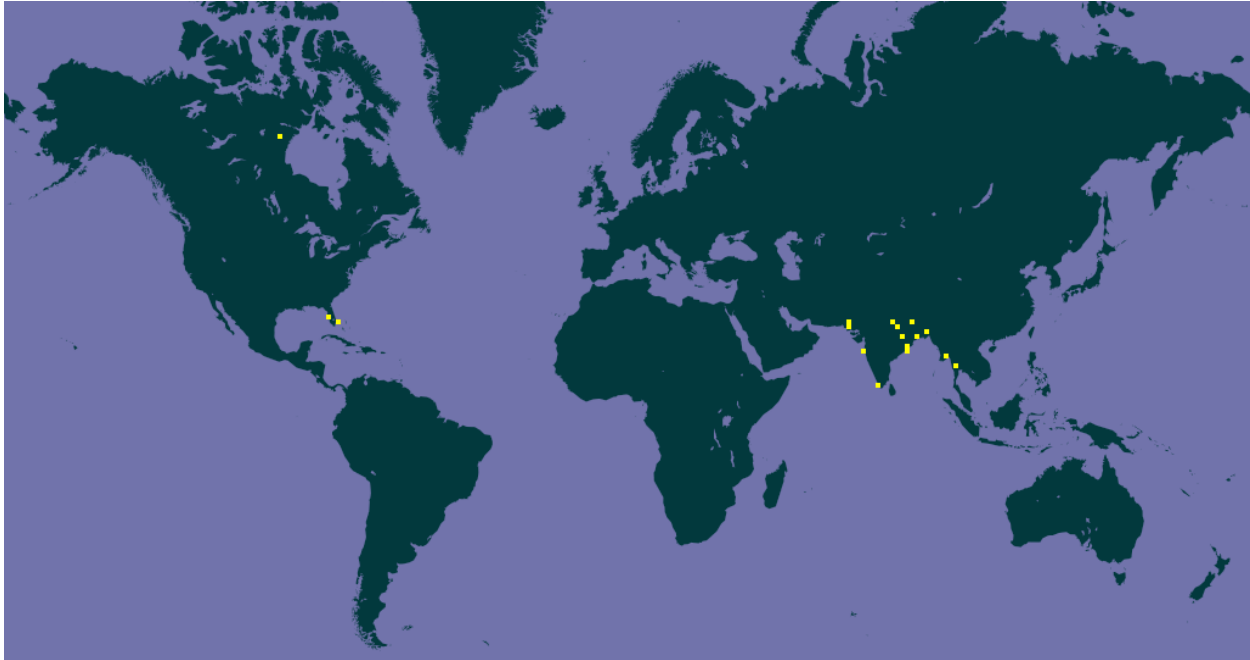
From Rimmer et al. (2016):

“In 2003, DGIV [dwarf gourami iridovirus] caused a mass mortality in intensively farmed Murray cod, *Maccullochella peelii* (Mitchell) (Lancaster, Williamson & Schroen 2003). Endemic to Australia, Murray cod is both an emerging aquaculture species and is a threatened species with high conservation value. Prior to this outbreak, megalocytiviruses were not recorded in Australia, with the only exception being one dwarf gourami, *Trichogaster lalius* (Hamilton) imported from Singapore that had histological lesions consistent with megalocytivirus infection (Anderson et al. 1993). Horizontal transmission of DGIV was demonstrated between Murray cod and subclinically infected dwarf gourami (Go & Whittington 2006). This evidence confirmed links between the origin of infection and the trade in live ornamental fish in Australia (Go et al. 2006).”

“In Australia, experimental exposure of Murray cod to live DGIV-infected dwarf gourami [*T. lalius*] led to transmission of the virus through water (Go & Whittington 2006). These findings make it plausible that discarded infected ornamental fish pose a potential threat to biodiversity in Australian natural environments in which Murray cod still exist (Go & Whittington 2006).”

## 4 Global Distribution

---



**Figure 1.** Known global distribution of *Trichogaster lalius*. Locations are in southern Asia, United States, and Canada. Map from GBIF Secretariat (2016).

The location in Canada was not used as a source point for the climate match. It could not be confirmed that the observation was from an established population (FAO 2016b; Froese and Pauly 2016).

The location in Thailand was not used as a source point for the climate match; it is the result of aquarium specimens.

The location in Myanmar was not used as a source point for the climate match. The collection occurred in 1937 and there are no further records to confirm if it is the result of an established population.

The records for the established populations in Colombia and Taiwan do not provide location information and therefore could not be used as source locations for the climate match.

## 5 Distribution Within the United States

---



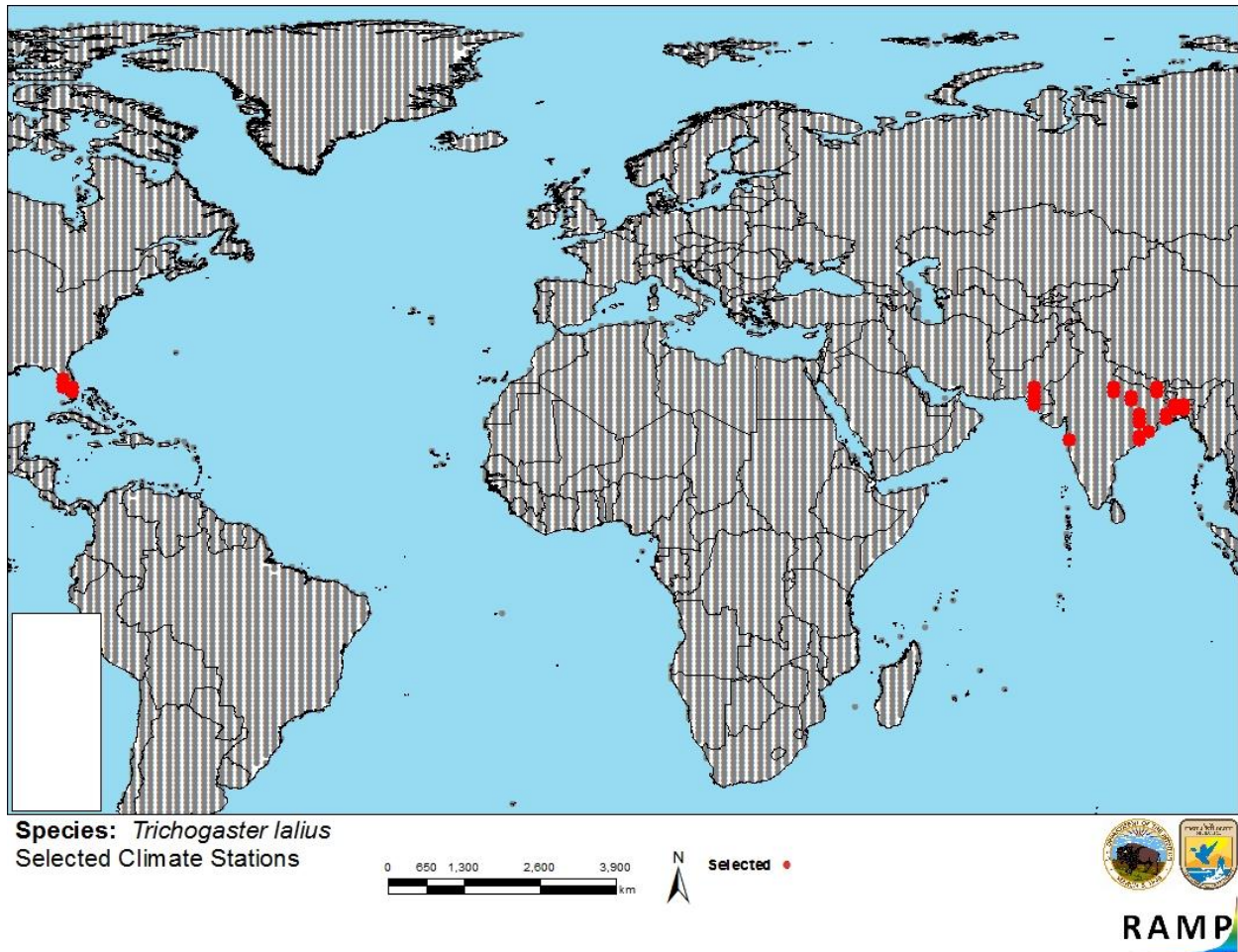
**Figure 2.** Known distribution of *Trichogaster lalius* in the United States. Locations are in Florida. Map from Nico (2016).



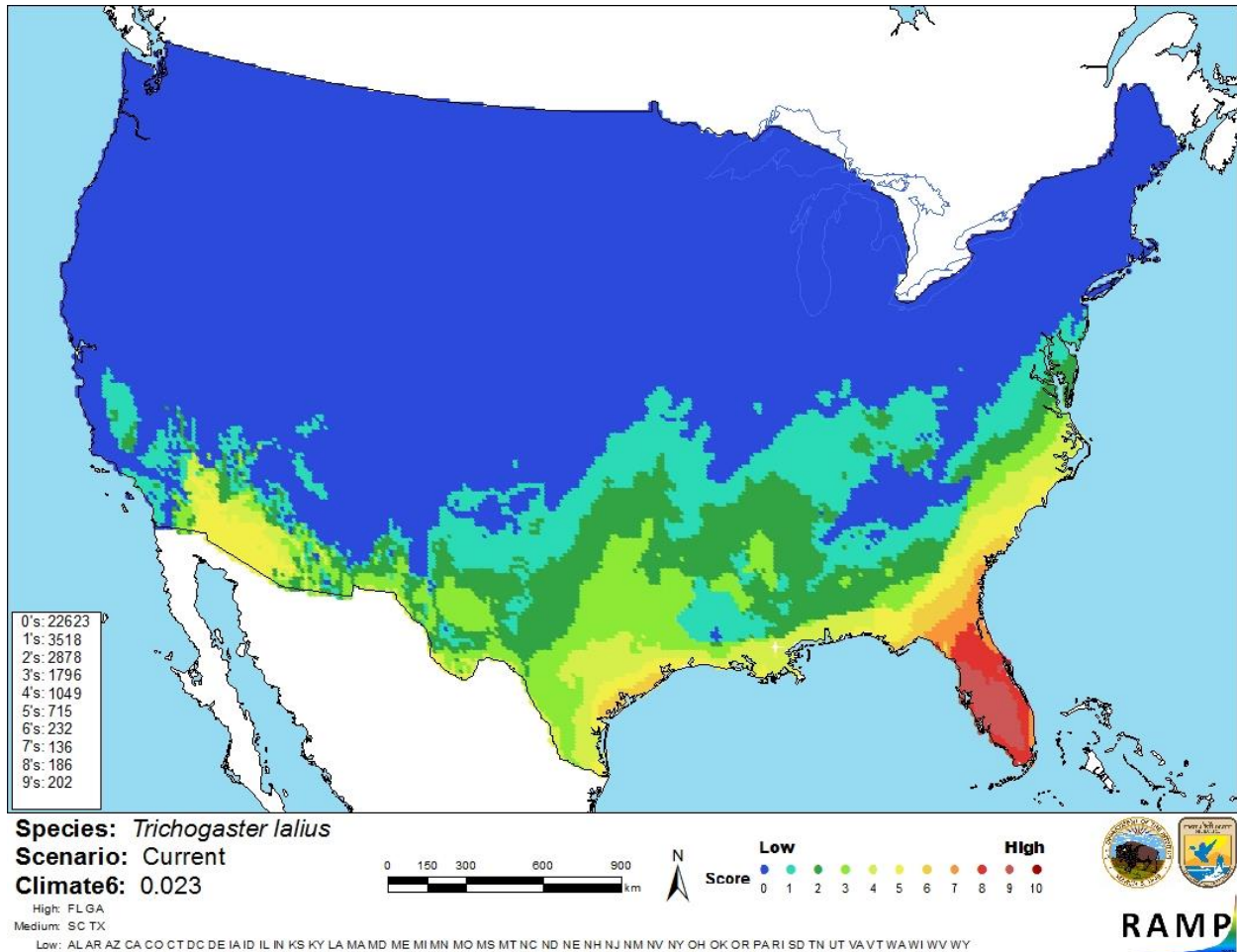
## 6 Climate Matching

### Summary of Climate Matching Analysis

The climate match for *Trichogaster lalius* was high in Florida, medium along part of the Gulf Coast, southern Atlantic Coast, and the Mexican border with Nevada. There was a medium match for the far south and a low match everywhere else. The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous United States was 0.023, medium, and individually high in Florida and Georgia.



**Figure 3.** RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red; United States, India, Pakistan, Bangladesh, Nepal) and non-source locations (grey) for *Trichogaster lalius* climate matching. Source locations from GBIF Secretariat (2016) and Nico (2016).



**Figure 4.** Map of RAMP (Sanders et al. 2014) climate matches for *Trichogaster lalius* in the contiguous United States based on source locations reported by GBIF Secretariat (2016) and Nico (2016). 0 = Lowest match, 10 = Highest match. Counts of climate match scores are tabulated on the left side of the map.

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
$\geq 0.103$	High

## 7 Certainty of Assessment

The certainty of assessment for *Trichogaster lalius* is high. There was adequate ecological and biological information available. Records of introductions were found along with information on impacts of those introductions. There were records of established populations in Colombia and Taiwan but no information on where in the country it occurred.

## 8 Risk Assessment

---

### Summary of Risk to the Contiguous United States

The history of invasiveness for *Trichogaster lalius* is high. There are many records of introduction but most of them do not seem to have resulted in an established population. This species has been shown to transmit infectious diseases that have significant detrimental effects on threatened species in Australia. The climate match was medium with the highest match in Florida, where there are already established populations of this species. The certainty of assessment is medium. The overall risk assessment category is high.

### Assessment Elements

- **History of Invasiveness (Sec. 3): High**
- **Climate Match (Sec. 6): Medium**
- **Certainty of Assessment (Sec. 7): Medium**
- **Remarks/Important additional information** No additional remarks.
- **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.**

Dorn, R. 1916. Aquarium culture of *Trichogaster lalius*. *Copeia* 28:17–20.

Eschmeyer, W. 2017. Catalog of fishes online database. California Academy of Sciences, San Francisco. Available:  
<http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>.  
(February 2017).

FAO (Fisheries and Agriculture Organization of the United Nations). 2016a. *Trichogaster lalia*. Database on introductions of aquatic species. FAO, Rome. Available:  
<http://www.fao.org/fishery/introsp/2706/en>. (April 2016).

FAO (Fisheries and Agriculture Organization of the United Nations). 2016b. *Colia lalia*. Database on introductions of aquatic species. FAO, Rome. Available:  
<http://www.fao.org/fishery/introsp/416/en>. (April 2016).

Froese, R., and D. Pauly, editors. 2016. *Trichogaster lalius* (Hamilton, 1822). FishBase. Available: <http://www.fishbase.us/summary/SpeciesSummary.php?ID=4774>. (April 2016).

GBIF Secretariat. 2016. GBIF backbone taxonomy: *Trichogaster lalius*. Global Biodiversity Information Facility, Copenhagen. Available: <http://www.gbif.org/species/5211200>. (April 2016).

- ITIS (Integrated Taxonomic Information System). 2016. *Colisa lalia* (Hamilton, 1822). Integrated Taxonomic Information System, Reston, Virginia. Available: [http://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=172626](http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=172626). (April 2016).
- Nico, L. 2016. *Trichogaster lalia*. U.S. Geological Survey, Nonindigenous Aquatic Species Database, Gainesville, Florida. Available: <http://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=329>. (April 2016).
- Papavlasopoulou, I., L. Vardakas, C. Perdikaris, D. Kommatas, and I. Paschos. 2014. Ornamental fish in pet stores in Greece: a threat to biodiversity? *Mediterranean Marine Science* 15(1):126–134.
- Rimmer, A. E., R. J. Whittington, A. Tweedie, and J. A. Becker. 2016. Susceptibility of a number of Australian freshwater fishes to dwarf gourami iridovirus (infectious spleen and kidney necrosis virus). *Journal of Fish Diseases* DOI:10.1111/jfd.12510.
- Sanders, S., C. Castiglione, and M. Hoff. 2014. Risk assessment mapping program: RAMP. U.S. Fish and Wildlife Service.
- Vishwanath, W. 2010. *Trichogaster lalius*. The IUCN Red List of Threatened Species 2010: e.T166445A6210533. Available: <http://www.iucnredlist.org/details/full/166445/0>. (April 2016).

## 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.**

- Anderson, I. G., H. C. Prior, B. J. Rodwell, and G. O. Harris. 1993. Iridovirus-like virions in imported Dwarf gourami (*Colisa lalia*) with systemic amoebiasis. *Australian Veterinary Journal* 70:66–67.
- Baensch, H. A., and R. Riehl. 1985. *Aquarien atlas*. Band 2. Mergus, Verlag für Natur-und Heimtierkunde GmbH, Melle, Germany.
- Courtenay, W. R., Jr., and D. A. Hensley. 1979. Survey of introduced non-native fishes. Phase I report. *Introduced exotic fishes in North America: status 1979*. National Fishery Research Laboratory, U.S. Fish and Wildlife Service, Gainesville, Florida.
- Courtenay, W. R., Jr., H. F. Sahlman, W. W. Miley, II, and D. J. Herrema. 1974. Exotic fishes in fresh and brackish waters of Florida. *Biological Conservation* 6(4):292–302.

- Go, J., and R. J. Whittington. 2006. Experimental transmission and virulence of a megalocytivirus (Family Iridoviridae) of Dwarf gourami (*Colisa lalia*) from Asia in Murray cod (*Maccullochella peelii peelii*) in Australia. *Aquaculture* 258:140–149.
- Go J., M. Lancaster, K. Deece, O. Dhungyel, and R. Whittington. 2006. The molecular epidemiology of iridovirus in Murray cod (*Maccullochella peelii peelii*) and Dwarf gourami (*Colisa lalia*) from distant biogeographical regions suggests a link between trade in ornamental fish and emerging iridoviral diseases. *Molecular and Cellular Probes* 20:212–222.
- Hamilton, F. 1822. An account of the fishes found in the river Ganges and its branches. Edinburgh and London.
- Jayaram, K. C. 1981. The freshwater fishes of India: a handbook. Zoological Survey of India, Calcutta.
- Lancaster, M. J., M. M. Williamson, and C. J. Schroen. 2003. Iridovirus-associated mortality in farmed Murray cod (*Maccullochella peelii peelii*). *Australian Veterinary Journal* 81:633–634.
- Ogilvie, V. E. 1969. Illustrated checklist of fishes collected from the L-15 Canal (Lake Worth Drainage District) in Palm Beach County, Florida (collection date November 8, 1969). Unpublished Report for the Florida Game and Fresh Water Fish Commission.
- Rahman, A. K. A. 1989. Freshwater fishes of Bangladesh. Zoological Society of Bangladesh. Department of Zoology, University of Dhaka, Bangladesh.
- Talwar, and Jhingran. 1992. [Source material did not provide full citation for this reference.]
- Watters, T. G., and S. H. O'Dee. 1998. Metamorphosis of freshwater mussel glochidia (Bivalvia: Unionidae) on amphibians and exotic fishes. *American Midland Naturalist* 139:49–57.
- Welcomme, R. L. 1988. International introductions of inland aquatic species. FAO Fisheries Technical Paper 294.