# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Tridentiger trigonocephalus***

***Tridentiger trigonocephalus*** 正體中文

**System:** Marine_freshwater_brackish

| Kingdom | Phylum | Class | Order | Family |
|---|---|---|---|---|
| Animalia | Chordata | Actinopterygii | Perciformes | Gobiidae |

**Common name**

trident goby (English), Oriental goby (English), striped goby (English), polosatyi trekhzubyi bychok (Russian, Russian Federation), Chameleon goby (English), Japanese goby (English), shimahaze (Japanese, Japan), striped tripletooth goby (English, Russian Federation), shimahaze (Japanese)

**Synonym**

*Gobius fasciapectoralis* , Fowler, 1938
*Triaenophorichthys taeniatus* , Gunther, 1874
*Triaenophorichthys trigonocephalus* , Gill, 1859
*Triaenophorus trigonocephalus* , Gill, 1858
*Tridentiger bifasciatus* , Steindachner, 1881
*Tridentiger bucco* , Jordan and Snyder, 1901
*Tridentiger taeniatus* , Reeves, 1927
*Tridentiger trigonocephalus* , Rendahl, 1924
*Trifissus ioturus* , Jordan & Snyder, 1900
*Triaenophorus trigonocephalus*

**Similar species**

**Summary**

Treidentiger trigonocephalus (the chameleon goby) is a native fish of Asia which is spread through ship ballast water or via eggs laid on hulls. It has established in California and Australia where it has been introduced. The main impact of this species is thought to be competition with native species.

view this species on IUCN Red List

**Species Description**

The Chameleon goby is a grey-brown coloured goby with a white speckled head and two characteristic black stripes (Hayes *et al*. 2005). The stripes go from behind the eye to the tail fin and from the snout along the upper portion of pectoral fin to the tail fin. It is able to mask the black stripes by changing its colour to a grey-brown. There are two dorsal fins, which often have brown horizontal stripes and scattered white spots. The anal fin has a grey to orange stripe along the middle (NIMPIS 2006). Adult can grow to 120mm in length (NIMPIS 2006). Eggs are somewhat pointed at one end (Breder and Rosen 1966, in FishBase 2006). There is a cluster of adhesive filaments at basal pole and the yolk is yellowish; with the late embryo pigmented on hindgut and ventral margin of tail (Watson 1996, in FishBase 2006).

**Lifecycle Stages**

Chameleon gobies are relatively short-lived, reaching sexual maturity within one year and living up to three years.

**Habitat Description**
Chameleon goby can live in freshwater, brackish and marine habitats, including artificial habitats. It lives in shallow water on (or near) the bottom, under rocks, in burrows, or in crevices (NIMPIS 2006). This bottom dweller may find a home in seagrass meadows (Kwak 2003). In its native range, the Chameleon goby is typically found in rocky areas of coastal bays and in freshwater (Fishbase 2006). In its introduced range in Australia it is found in both brackish and saltwater, while in USA it is found in brackish and freshwater environments (Fishbase 2006).

**Reproduction**
Male and female Chameleon goby are separate, and eggs are laid during spring and summer. Eggs are deposited in nests which are guarded by the male (Breder and Rosen 1966, in FishBase 2006). Eggs take nine to 10 days to hatch. Females are able to spawn up to 10 times within a breeding season, which is from March through to November in the USA (FishBase 2006). In Japan, temperatures during the breeding season are between 18°C to 26°C.

**Nutrition**
The Chameleon goby mostly takes its prey from within the sediment and may consume large numbers of polychaetes, feeding mainly at night (Kwak 2003). Stomach contents have also been found to include crab larvae and caprellid amphipods (Kwak 2003).

**General Impacts**
Chameleon goby have specific habitat requirements and it is therefore possible that they will compete with species sharing their preferred habitat (NIMPIS 2006).

**Management Info**
Preventative measures: A two year study was undertaken for the Department of Environment and Heritage (Australia) by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to identify and rank introduced marine species found within Australian waters and those not found within Australian waters.
All of the non-native potential target species identified in this report are ranked as high, medium and low priority, based on their invasion potential and impact potential. *Tridentiger trigonocephalus* is identified as one of ten potential domestic target species most likely to be spread to uninfected bioregions by shipping. A hazard ranking of potential domestic target species based on invasion potential from infected to uninfected bioregions identifies *T. trigonocephalus* as a 'low priority species' - these species have a low impact potential and a low invasion potential relative to the other domestic non-native species identified in the report.
For more details, please see Hayes *et al.* 2005.
The rankings determined in Hayes *et al.* 2005 will be used by the National Introduced Marine Pest Coordinating Group in Australia to assist in the development of national control plans which could include options for control, eradication and/or long term management.

**Pathway**
Fertilised eggs of *T. trigonocephalus* may have been transported along with Pacific oysters in commerical shipments (Hayes *et al*. 2005).Many introduced marine species are first recorded from regions with commercial ports and it is believed the large amounts of ballast water carried by international shipping is the most common way introduced marine species are transported (Carlton 1985, inThe eggs of *T. trigonocephalus* may be transported attached to fouling organisms on vessel hulls (Hayes *et al.*, 2005).

**Principal source:**

**Compiler:** IUCN/SSC Invasive Species Specialist Group (ISSG) with support from La Fondation d'entreprise Total

**Review:**

**Pubblication date:** 2007-01-10

## ALIEN RANGE

**[4]** AUSTRALIA

**[9]** UNITED STATES

## BIBLIOGRAPHY

**14** references found for **Tridentiger trigonocephalus**

**Managment information**

Centre for Environment, Fisheries & Aquaculture Science (CEFAS)., 2008. Decision support tools-Identifying potentially invasive non-native marine and freshwater species: fish, invertebrates, amphibians.

**Summary:** The electronic tool kits made available on the Cefas page for free download are Crown Copyright (2007-2008). As such, these are freeware and may be freely distributed provided this notice is retained. No warranty, expressed or implied, is made and users should satisfy themselves as to the applicability of the results in any given circumstance. Toolkits available include 1) FISK- Freshwater Fish Invasiveness Scoring Kit (English and Spanish language version); 2) MFISK- Marine Fish Invasiveness Scoring Kit; 3) MI-ISK- Marine invertebrate Invasiveness Scoring Kit; 4) FI-ISK- Freshwater Invertebrate Invasiveness Scoring Kit and AmphISK- Amphibian Invasiveness Scoring Kit. These tool kits were developed by Cefas, with new VisualBasic and computational programming by Lorenzo Vilizzi, David Cooper, Andy South and Gordon H. Copp, based on VisualBasic code in the original Weed Risk Assessment (WRA) tool kit of P.C. Pheloung, P.A. Williams & S.R. Halloy (1999).
The decision support tools are available from:
http://cefas.defra.gov.uk/our-science/ecosystems-and-biodiversity/non-native-species/decision-support-tools.aspx [Accessed 13 October 2011]
The guidance document is available from http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf [Accessed 13 January 2009].

Hayes, K., Sliwa, C., Migus, S., McEnnulty, F., Dunstan, P. 2005. National priority pests: Part II Ranking of Australian marine pests. An independent report undertaken for the Department of Environment and Heritage by CSIRO Marine Research.

**Summary:** This report is the final report of a two year study designed to identify and rank introduced marine species found within Australian waters (potential domestic target species) and those that are not found within Australian waters (potential international target species).
Available from: http://www.marine.csiro.au/crimp/reports/PrioritypestsFinalreport.pdf [Accessed 25 May 2005]

Mendoza, R.E.; Cudmore, B.; Orr, R.; Balderas, S.C.; Courtenay, W.R.; Osorio, P.K.; Mandrak, N.; Torres, P.A.; Damian, M.A.; Gallardo, C.E.; Sanguines, A.G.; Greene, G.; Lee, D.; Orbe-Mendoza, A.; Martinez, C.R.; and Arana, O.S. 2009. Trinational Risk Assessment Guidelines for Aquatic Alien Invasive Species. Commission for Environmental Cooperation. 393, rue St-Jacques Ouest, Bureau 200, Montr&#65533;al (Qu&#65533;bec), Canada. ISBN 978-2-923358-48-1.

**Summary:** In 1993, Canada, Mexico and the United States signed the North American Agreement on Environmental Cooperation (NAAEC) as a side agreement to the North American Free Trade Agreement (NAFTA). The NAAEC established the Commission for Environmental Cooperation (CEC) to help the Parties ensure that improved economic efficiency occurred simultaneously with trinational environmental cooperation. The NAAEC highlighted biodiversity as a key area for trinational cooperation. In 2001, the CEC adopted a resolution (Council Resolution 01-03), which created the Biodiversity Conservation Working Group (BCWG), a working group of high-level policy makers from Canada, Mexico and the United States. In 2003, the BCWG produced the &#65533;Strategic Plan for North American Cooperation in the Conservation of Biodiversity.&#65533; This strategy identified responding to threats, such as invasive species, as a priority action area. In 2004, the BCWG, recognizing the importance of prevention in addressing invasive species, agreed to work together to develop the draft CEC Risk Assessment Guidelines for Aquatic Alien Invasive Species (hereafter referred to as the Guidelines). These Guidelines will serve as a tool to North American resource managers who are evaluating whether or not to introduce a non-native species into a new ecosystem. Through this collaborative process, the BCWG has begun to implement its strategy as well as address an important trade and environment issue. With increased trade comes an increase in the potential for economic growth as well as biological invasion, by working to minimize the potential adverse impacts from trade, the CEC Parties are working to maximize the gains from trade while minimizing the environmental costs.
Available from: English version: http://www.cec.org/Storage/62/5516_07-64-CEC%20invasives%20risk%20guidelines-full-report_en.pdf [Accessed 15 June 2010]
French version: http://www.cec.org/Storage/62/5517_07-64-CEC%20invasives%20risk%20guidelines-full-report_fr.pdf [Accessed 15 June 2010]
Spanish version: http://www.cec.org/Storage/62/5518_07-64-CEC%20invasives%20risk%20guidelines-full-report_es.pdf [Accessed 15 June 2010].

National Introduced Marine Pest Information System (NIMPIS). 2006. *Tridentiger trigonocephalus*.

**Summary:** This online database provides information about *T. trigonocephalus* taxonomy, description, distribution, habitat, reproduction and growth, feeding preference, control methods and similar species.
Available from: http://www.marine.csiro.au/crimp/nimpis/Default.htm [Accessed 8 December 2006].

**General information**

FishBase, 2006. *Tridentiger trigonocephalus*.
**Summary:** This online database provides information related to the distribution, biology and habitat of *T. trigonocephalus*.
Avilable from:
http://filaman.ifm-geomar.de/Summary/speciesSummary.php?ID=3899&genusname=Tridentiger&speciesname=trigonocephalus[Accessed 8 December 2006].
Gill, H.S. and Potter, I.C. 1993, Spatial segregation amongst goby species within an Australian estuary, with a comparison of the diets and salinity tolerance of the two most abundant speceis. In *Marine Biology* 117: 515-526.
**Summary:** This study investigates the spatial distribution of various species of goby found in Swan Estuary (Australia).
Hayashi, M. 1979. Seasonal succession and food habits of the gobioid fishes in the Odawa Bay Yokosuka Japan. In Goto, Y (ed.) *Science report of the Yokosuka city museum 26*: 35-56.
**Summary:** This two year study looks at seasonal succession and food habits of the gobioid fishes in Odawa Bay (Japan).
Hovel, K.A. and Anderson, T.W. 2005. *Evaluating eelgrass restoration: effects of habitat structure on fish recruitment and epifaunal diversity in San Diego Bay*. San Diego State University.
**Summary:** This research looks at how restored eelgrass beds in San Diego Bay provide a habitat for eelgrass epifauna.
Avialable from: http://www.portofsandiego.org/sandiego_environment/documents/SDSU_revised_final_report_2.pdf [Accessed 8 December 2006].
ITIS (Integrated Taxonomic Information System). 2006. Online Database *Triaenophorus trigonocephalus*
**Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=331702 [Accessed 23 August 2006]
Kwak, S.N., Huh, S.H. and Klumpp, D.W. 2004. Partitioning of food resources among *Sillago japonica*, *Ditremma temmincki*, *Tridentiger trigonocephalus*, *Hippocampus japonicus* and *Petroscirtes breviceps* in an eelgrass, *Zostera marina*, bed, *Environmental Biology of Fishes 71*(4).
**Summary:** This is a dietary analysis of five numerically abundant fishes in an eelgrass bed in Kwangyang Bay, Korea.
Lee, T.W. 1999. Seasonal variation in species composition of demersal fish in Yongil Bay, East coast of Korea, *Journal of the Korean Fisheries Society 32*(4): 512-519.
**Summary:** This study looks at seasonal variation in species composition and abundance of demersal fish in Yongil Bay (Korea).
Lockett, M.M. and Gomon, M.F. 2001. Ship mediated fish invasions in Australia: two new introductions and a consideration of two previous invasions, *Biological Invasions 3*: 187-192
**Summary:** This paper looks at two recent fish introductions in Australia (*Acentrogobius pflaumi* and *Forsterygion lapillum*) and two previous introductions (*Acanthogobius flavimanus* and *Tridentiger trigonocephalus*).
Mukai, T., Naruse, K., Sato, T., Shima, A. and Morisawa, M. 1997. Multiregional introgressions inferred from the Mitochondrial DNA Phylogeny of a Hybridizing species comples of Gobiid fishes, genus *Tridentiger*, *Mol. Biol. Evol. 14*(12): 1258-1265.
**Summary:** This study looks at partial sequences of the cytochrome *b* gene of the mitochondrial DNA of brackishwater gobiid fishes in the genus *Tridentiger*, collected from the Japanese Archipelago. Interspecific and geographic variations are analysed and compared.
United States Geological Survey. (USGS) 2006. *Triaenophorus trigonocephalus*.
**Summary:** This website provides information about the distribution of *Triaenophorus trigonocephalus* in the United States of America.
Available from: http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=717 [Accessed 8 December 2006]