**Oreochromis aureus**

**System:** Freshwater

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**Common name**

Blue tilapia (English)

**Synonym**

- *Chromis aureus*, (Steindachner, 1864)
- *Sarotherodon aureus*, (Steindachner, 1864)
- *Tilapia aurea*, (Steindachner, 1864)
- *Tilapia aurea exul*, (Steindachner, 1864)
- *Tilapia kacherbi*, (Wunder, 1960)
- *Tilapia kashabi*, (Elster, 1958)
- *Tilapia lemassoni*, (Blache & Milton, 1960)
- *Tilapia monodi*, (Daget, 1954)

**Similar species**

*Oreochromis niloticus*

**Summary**

*Oreochromis aureus* (blue tilapia) is native to parts of Africa and the Middle East and is an important food source throughout the world. *Oreochromis aureus* are easily raised as they are resilient and prolific and have a high grain-to-feed conversion rate. Worldwide introductions for use in aquaculture have provided an essential source of protein to many nations. However, these characteristics have allowed them to dominate many of their introduced ranges by displacing native species and restructuring aquatic communities in areas where they have established by means of escape from confinement or deliberate release.

[view this species on IUCN Red List](http://www.iucngisd.org/gisd/species.php?sc=1323)

**Species Description**

*Oreochromis aureus* is a cichlid blue and silver in color with 18-26 gill rakers, 16 dorsal spines, and 3 anal spines. The caudal fin has a broad pink to red distal margin. Males are significantly larger than females with a max length of 50.8 cm. Breeding males exhibit an intense bright metallic blue on their head, a vermillion edge to their dorsal fin, and a more intense pink on the caudal fin. Breeding females exhibit paler more orange edges to their dorsal and caudal fins (GSMFC, 2003; FishBase, 2007)
Notes
Oreochromis aureus is believed to have been documented as Oreochromis nilotica in many accounts since many identifications were made before the two species were differentiated. O. aureus may be identified by its lack of dark vertical stripes present on the caudal fins of O. niloticus (GSMFC, 2003; Nico, 2007).

Lifecycle Stages
Hatching occurs about 3 days after oviposition, and juveniles remain in their mother mouth until they are about 1 cm long. They school near their mothers mouth for about five days before going on their own. Young are particulate feeders during larval and juvenile stages (McKaye et al. 1995; FishBase, 2007).

Uses
Oreochromis aureus is a prolific and tolerant species introduced worldwide for aquaculture, angling, and the control of aquatic vegetation. They are popularly used for hybridization in producing all male populations (FishBase, 2007). Power companies have introduced O. aureus for food and sport, as well as vegetation control, in heated effluent ponds used to cool effluents from plants which are too warm to support native fish (Nico, 2007).

Habitat Description
Oreochromis aureus is benthopelagic and potamodromous. It prefers tropical climate but is fairly cold tolerant. It occurs in temperatures 8°-30° C and freshwater to fairly brackish salinities. O. aureus is considered hardy and tolerant to a wide range of water quality and habitat conditions (McKaye et al. 1995; FishBase, 2007).

Reproduction
Ovophilic: external fertilization, capable of breeding in freshwater and brackish water. Reproduction of Oreochromis aureus is stimulated by long photoperiods and requires a minimum temperature of 20° C. Males dig a spawning pit, usually among weedy areas, which they defend aggressively. They visit schools of females to attract a mate. Courting behaviour includes lateral display, nipping, and tail flapping by both sexes. Females deposit eggs in single clutches. A maternal mouthbrooder, females take the eggs into their mouth as soon as they are fertilized and swim to deeper waters while the male attempts to spawn with another female. Hatching occurs about 3 days after oviposition, and juveniles remain in their mother mouth until they are about 1 cm long. They school near their mothers mouth for about five days before going on their own. O. Aureus does not have strict habitat requirements for reproduction, so introduced populations can take up all available habitat for breeding sites (McKaye et al. 1995; FishBase, 2007)

Nutrition
Oreochromis aureus feeds primarily on phytoplankton and epiphytic algae, but has a wide diet including insects, zooplankton, vascular plants, and larval and juvenile fishes. Young have a more varied diet which includes large quantities of copepods and cladocerans (McKaye et al. 1995; GSMFMC, 2003).
General Impacts

*Oreochromis aureus* competes with native fishes for food, spawning area, and space, and exhibits aggressive behavior. They have become the dominant species in many of their introduced ranges. Several introductions have correlated with and are believed to cause reductions in abundance of native fishes and even molluscs. Blue tilapia structure phytoplankton communities by their feeding preference of specific algae, having significant effects on the entire community ecology. Some reports maintain certain introduced areas have lost most and nearly all native fishes (McDonald, 1987; GSMFC, 2003; FishBase, 2007; Nico, 2007).
Management Info

Preventative measures: The use of potentially invasive alien species for aquaculture and their accidental release/or escape can have negative impacts on native biodiversity and ecosystems. Hewitt et al. (2006) Alien Species in Aquaculture: Considerations for responsible use aims to first provide decision makers and managers with information on the existing international and regional regulations that address the use of alien species in aquaculture, either directly or indirectly; and three examples of national responses to this issue (Australia, New Zealand and Chile). The publication also provides recommendations for a ‘simple’ set of guidelines and principles for developing countries that can be applied at a regional or domestic level for the responsible management of Alien Species use in aquaculture development. These guidelines focus primarily on marine systems, however may equally be applied to freshwater.

Copp et al., (2005) Risk identification and assessment of non-native freshwater fishes presents a conceptual risk assessment approach for freshwater fish species that addresses the first two elements (hazard identification, hazard assessment) of the UK environmental risk strategy. The paper presents a few worked examples of assessments on species to facilitate discussion. The electronic Decision-support tools- Invasive-species identification tool kits that includes a freshwater and marine fish invasives scoring kit are made available on the Cefas (Centre for Environment, Fisheries & Aquaculture Science) page for free download (subject to Crown Copyright (2007-2008)).

Most management techniques to control undesired fish populations are not effective for control of tilapia. Prevention of escape and care in stocking of Oreochromis aureus can effectively prevent their establishment of wild populations. Totally closed systems should always be used when cultivating blue tilapia, and only in watersheds where tilapia have already penetrated. O. aureus aquaculture should be banned from watersheds and lakes in which they have not become established (McCrary et al. 2007).

Physical: Oreochromis aureus populations of Brunner Island, Pennsylvania were eradicated in 1986, when condenser cooling water was deliberately and temporarily released at lethal, low temperature. One study recommended the temperature be brought to 5°C for 16 hours to effectively eradicate O. aureus (Stauffer et al. 1988; Costa-Pierce, 2001; Nico, 2007).

Biological: The use of predatory fish Morone saxatilis X Morone chrysops and Sciaenops ocellatus has been effectively employed to reduce wild spawning among tilapia hybrids (Oreochromis niloticus X Oreochromis aureus) in aquaculture growout ponds. However, such introductions in the wild would have their own ecological effects. Other known predators and possible controls include: snakehead (Channa striata), tarpon (Megalops cyprinoides), Nile perch (Lates niloticus), Hemichromis fasciatus, and Cichlasoma managuensis (Milstein et al. 2000).

A management program in Lake Nicaragua to increase the abundance of potential predators of large tilapias, including Oreochromis aureus such as alligators, Crocodilus acutus, Crocodilus gars and Crocodilus elasmobranchs, all vastly reduced from just a few decades earlier, has been recommended (McCrary et al. 2007).

Integrated management: Promotion and augmentation of fishing pressure on O. aureus in order to reduce the average fish size and thereby free niche space for other fishes is another recommended means of controlling their populations (McCrary et al. 2007).
Pathway
Many introductions of Oreochromis aureus have been to control aquatic vegetation (Nico, 2007). Oreochromis aureus, a tolerant and prolific species has been stocked as a food species in rivers, lakes, and ponds throughout the world (Nico, 2007).

Principal source: FishBase, 2007. Oreochromis aureus Blue tilapia

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review: Pam Fuller USGS/BRD, Nonindigenous Aquatic Species Program. Florida Integrated Science Center. USA

Publication date: 2008-03-27

ALIEN RANGE
[1] UNITED ARAB EMIRATES [15] UNITED STATES
[1] ZAMBIA

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31 references found for Oreochromis aureus

Management information
A study on the effects of invasive tilapia on Lake Nicaragua. 
(Steindachner, 1864)

Global Invasive Species Database (GISD) 2020. Species profile Oreochromis aureus.


The guidance document is available from http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf [Accessed 13 January 2009].


In 1993, Canada, Mexico and the United States signed the North American Agreement on Environmental Cooperation (NAACE) 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 Strategic Plan for North American Cooperation in the Conservation of Biodiversity. 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.

**Summary:** Experiment using predatory fishes as a control for *Oreochromis aureus*.


**Summary:** This is a detailed profile concerning *Oreochromis aureus* and its introductions to the United States. Available from: http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=463 [Accessed 3 March 2008]


**Summary:** An abstract of a study suggesting cold shock as a means of eradicating *Oreochromis aureus*.

**General information**


**Summary:** English: The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (http://www.conabio.gob.mx/invasoras/index.php/Portada), under the section Novedades for information on updates. Invasive species - fish is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Peces [Accessed 30 July 2008]

Spanish:

La lista de especies del Sistema de información sobre especies invasoras en M?xico cuenta actualmente con información acerca de nombre científico, familia, grupo y nombre común, así como el estado de la invasión en México, rutas de introducción y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una lista directa a la página de alertas. Es importante resaltar que las listas se encuentran en constante proceso de actualización, por favor consulte la portada (http://www.conabio.gob.mx/invasoras/index.php/Portada), en la sección de novedades, para conocer los cambios.

**Species invasoras - Peces** is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Peces [Accessed 30 July 2008]


**Summary:** Available from: http://massbay.mit.edu/publications/marinebioinvasions/mibi2_abstracts.pdf [Accessed 4 March 2008]

FishBase, 2007. *Oreochromis aureus* Blue tilapia: Common names

**Summary:** Available from: http://www.fishbase.org/comnames/CommonNamesList.cfm?ID=1387&GenusName=Oreochromis&SpeciesName=aureus &StockCode=1423 [Accessed 3 March 2008]

FishBase, 2007. *Oreochromis aureus* Blue tilapia: Countries where *Oreochromis aureus* is found

**Summary:** Available from: http://www.fishbase.org/Country/CountryList.cfm?ID=1387&GenusName=Oreochromis&SpeciesName=aureus [Accessed 3 March 2008]


**Summary:** Available from: http://www.fishbase.org/Ecology/FishEcologySummary.cfm?StockCode=1423&GenusName=Oreochromis&SpeciesName=aureus [Accessed 3 March 2008]

FishBase, 2007. *Oreochromis aureus* Blue tilapia: Ecosystem where *Oreochromis aureus* occurs

**Summary:** Available from: http://www.fishbase.org/trophiceco/EcosysList.cfm?ID=1387&GenusName=Oreochromis&SpeciesName=aureus [Accessed 3 March 2008]

FishBase, 2007. *Oreochromis aureus* Blue tilapia: Reproduction

**Summary:** Available from: http://www.fishbase.org/Reproduction/FishReproSummary.cfm?ID=1387&GenusName=Oreochromis&SpeciesName=aureus&fc=349&StockCode=1423 [Accessed 3 March 2008]
FULL ACCOUNT FOR: Oreochromis aureus

FishBase, 2007. Oreochromis aureus Blue tilapia. Summary


ITIS (Integrated Taxonomic Information System), 2008. Online Database Oreochromis aureus (Steindachner, 1864)
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.


Summary: Record of exotic fish in China


Schwanck, Erkki J., 1995. The introduced Oreochromis niloticus is spreading on the Kafue floodplain, Zambia

Summary: A brief article concerning Oreochromis aureus in Zambia.


Summary: Cites competition between Oreochromis aureus and native species.