GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Channa marulius***

Channa marulius 正體中文

System: Freshwater

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Perciformes	Channidae

Common name

kalamasa (Marathi, India), haal (English, Pakistan), maral (Marathi, India), soal (English), ngamuporom (Manipuri, India), phoola-chapa (English, Andhra Pradesh), pa gooan (Lao, Lao People's Democratic Republic), Indian snakehead (English), pool-a-malle (Telugu, India), murrel (English), Augenfleck-Schlangenkopf (German, Germany), trey raws (English, Sri Lanka), pba gooa (Lao, Lao People's Democratic Republic), gangara (Sinhalese, Sri Lanka), pa kouan (Lao, Lao People's Democratic Republic), great snakehead (English), bhaura (Nepali, Nepal), pla chon ngu hao (English, Cambodia), nga-yan-daing (Burmese, Myanmar), iru viral (Tamil, Sri Lanka), kalumaha (Sinhalese, Sri Lanka), cobra snakehead (English), kæmpe-slangehovedfisk (Danish, Denmark), gozar (Bengali, Bangladesh), gajal (English, West Bengal), hoovina-mural (Kannada, India), poomeenu (English, Orissa), avalu (Kannada, India), saal (English, Punjab), vral (Malayalam, India), sawal (English, Punjab), sawl (Punjabi, India), sal (English, Assam), giant snakehead (English), pumurl (English, West Bengal), coaree Veralavuree (Tamil, India), bhor (English, Bihar), bullseye snakehead (English), kubrah (English, Bihar), zmeegolov-maruliy (Russian, Russian Federation), dowlah (English, Punjab), gajar (Bengali, Bangladesh), ara (Sinhalese, Karnataka), saul (Nepali, Nepal), aviu (English, Karnataka), pla tjon gnoo aow (Thai, Thailand), bral (English, Kerala), bohr (Hindi, India), phool-mural (English, Andhra Pradesh), saura (Nepali, Nepal), madinji (English, Karnataka), pumuri (Hindi, India), curuva (English, Kerala), aviri (English, Andhra Pradesh), chaeru-veraal (English, Tamil Nadu), puveral (English, Tamil Nadu), intiankäärmeenpää (Finnish, Finland)

Synonym

Channa marulia , (Hamilton, 1822)
Channa marulius , (Hamilton, 1822)
Channa marulius ara , (Deraniyagala, 1945)
Ophicephalus grandinosus , (Cuvier, 1831)
Ophicephalus leucopunctatus , (Sykes, 1839)
Ophicephalus marulius , (Hamilton, 1822)
Ophicephalus sowara , (Cuvier, 1831)
Ophiocephalus aurolineatus , (Day, 1870)
Ophiocephalus grandinosus , (Cuvier, 1831)
Ophiocephalus marulius ara , (Deraniyagala, 1945)
Ophiocephalus theophrasti , (Valenciennes, 1840)
Ophiocephalus pseudomarulius , (Günther, 1861)

Similar species

Amia calva, Channa spp., Crenicichla spp., Batrachops spp.

Summary

Little if any documentation is available on the effects of the bullseye snakehead (*Channa marulius*) on native fish populations. As a predator it may affect native ichthyofauna and subsequently disrupt native food webs. It's only recorded country of introduction is the USA.

view this species on IUCN Red List

Species Description
This snakehead species is an elongated fish, with a long dorsal fin, tubular nostrils and an ocellus near the base of the upper part of the caudal fin. There is no patch of scales on the gular region of the head. Lateral line scales drop two rows between the 16th and 18th perforated scale. Scale rows between the posterior margin of orbit and preopercular angle 10 degrees. Scales on top of the head are moderate-sized with a rosette of head scales between the orbits, with the frontal head scale in the center of the rosette. There are two scales between the rosette and the basal head scale, 10 scale rows between the propercular angle and posterior border of orbit, and the pectoral fin length is about half of the head length (Courtenay & Williams 2004). There is a distinctive orange spot on the caudal peduncle (Fuller 2009). This species has a large mouth, having a lower jaw containing seven to 18 canines behind a single row of villiform teeth that widen to five to six rows at jaw symphysis (Courtenay & Williams 2004). It has some of the largest teeth of any snakehead (Howells 2004). Teeth are present on prevomer but are absent on palatines. Juveniles may have a series of dark blotches along the sides, margined posteriorly and posterodorsally by a series of white scales. It is reported to be the largest species of the family Channidae, reaching a length of 120 to 122 centimeters. Talwar and Jhingran (1992, in USGS 2008) reported that it grows to 180 cm and a weight of 30 kg in Maharashtra State, western India, noting that a length of 30 cm can be attained in 1 year, however, Rohan Pethiyagoda and Prachya Musikasinthorn (Pers. Comm. 2002, in USGS 2008) stated they doubted that any snakehead would reach such a length and were unaware of any specimens of that size. Growth decreases with increasing age, with the greatest increase in weight occurring during the second year. In its native range it has been reported as having reached up to 60 pounds (Howells, 2004). The young are facultative airbreathers whereas the adults are obligate breathers. A peak in oxygen uptake has been exhibited at night. This species has been cited as being one of the two fastest growing snakeheads.

Uses
This fish is an important commercial, aquaculture, game and aquarium fish in various regions (FishBase 2008c). The bullseye snakehead has been cultured in ponds, ricefields, and irrigation wells that do not support other fishes. Ebanasar (1995) conducted a series of experiments on the biology, physiology and culture of this fish. It is reported that this fish is highly suitable for cage cultute and culture in ponds in combination with tilapia. It is found to be an effective tool in controlling the overpopulation of tilapia and thus checks stunted growth of tilapia. They are cultured as game fish in their native range because they put up a strong fight when hooked. Some snakeheads are highly valued as food fish, particularly northern snakehead (*Channa argus*), blotched snakehead (*Channa maculata*), Chinese snakehead (*Channa asiatica*), bullseye snakehead (*C. marulius*) and chevron snakehead (*Channa striata*) (Herborg *et al*. 2007).

Habitat Description
Channa marulius occurs in sluggish or standing water in rivers, canals, lakes and swamps. It tends to inhabit waters with submerged aquatic vegetation and is usually found only in deep pools in rivers and occasionally in lakes. It also enters flooded forests. The ideal temperature for this species is in the tropical range of approximately 24°C to 28°C (Pethiyagoda 1991). This species can exist in tropical, subtropical and warm temperate climates (Courtenay & Williams 2004). In a study by Lief-Mattias (2007), the mean air temperature was found to be the most significant environmental variable in regard to habitat suitability. This would help to explain the more tropical distribution of *C. marulius*, compared to other snakeheads like *C. argus*, that have also invaded the United States.

Reproduction
According to Agbayani (2002), the bullseye snakehead builds floating nests of weeds and leaves where orange-yellow eggs are deposited. The typical brood size of *C. marulius* is about 500 young, and is guarded by the parents until they reach about 10 cm in length. The eggs hatch within 54 hours at 16°C to 26°C and 30 hours at 28°C to 33°C. Breeding occurs through most of the year and can vary slightly depending on location (Courtenay & Williams 2004).

Nutrition
The bullseye snakehead fish is regarded as predacious, especially on other fishes. They cannot coexist in aquaria with other fish, including, bullseye snakeheads, once they have reached a length of 25 cm (Courtenay & Williams 2004). Dasgupta (2000, in USGS 2008) reported stomach contents of *C. marulius* collected from several localities in West Bengal, India, as consisting primarily of fishes (40%), followed by crustaceans (30%), macrophyte (15%), larval insects (10%), and algae (5%). Ahmad and others (1990, in USGS 2008) stated the diet of *C. marulius* in the River Kali, northern India, was more than 60 percent fishes and the remainder crustaceans, gastropods, insects, and larval chironomids.

General Impacts
Predation: Snakeheads are highly predatory and some have the ability to travel overland to new bodies of water. The bullseye snakehead is considered predacious (Jhingran 1984, Talwar & Jhingran 1992, in Hoffman 2002), especially on other fishes (Schmidt 2001, in Hoffman 2002). It also has the potential to impact native crustaceans through predation (Fuller 2009). In one stomach contents analysis study (N=127) it was found that the bullseye snakehead consumes its own species, bluegill, mosquitofish, warmouth, peacock bass, lizards, bufo toads, small turtles, a rat and a snake (Cocking 2008, in Fuller 2009).
Human health: Males, being territorial, will bite when they are caught (FishBase 2008c).\n

Management Info
The potential to eradicate or control snakehead populations depends on where they are found; if established in large lakes or river systems, eradication or control is expected to be nearly impossible; control in smaller water bodies depends upon the amount of vegetation, the accessibility to the water body, and the effectiveness of the control methods (Hoffman 2002). \n
Preventative measures: Areas surrounding the Gulf of Mexico, as well as large parts of Mexico itself, provide suitable habitat for establishment of *Channa marulius* (Lief-Mattias 2007). \n
The US Fish and Wildlife Service placed all snakehead fish in the Channidae family including *C. marulius*, on the federally regulated list of injurious fish in 2002, meaning their importation into or transportation between the continental United States and other territories in possession of the US is unlawful (Hoffman 2002). \n
Decision support tools for identifying potentially invasive non-native marine and freshwater species (fish, invertebrates and amphibians) have been adapted from Pheloung Williams and Halloy (1999) Weed Risk Assessment tool and are available online.
Decision support tools for identifying potentially invasive non-native marine and freshwater species (fish, invertebrates and amphibians) have been adapted from Pheloung Williams and Halloy (1999) Weed Risk Assessment. Please follow this link to access the decision support tool and kit.
A Risk-assessment for non-native freshwater species in the UK is available for determining the level of potential invasion The assessment can aid resource managers in decision making when it comes to management strategies.\n
Chemical: Piscicides work by preventing fish from removing oxygen from the water. Chemical control using Rotenone and similar toxins would likely be ineffective to air breathing snakeheads and damaging to nontarget organisms except in closed situations. \n
Physical: Electrofishing and netting may provide some level of control of snakehead populations; however, eradication using these methods would be too selective for [larger] size classes to remove a population of snakeheads. \n
Biological: Snakeheads are preyed upon by peacock bass and largemouth bass (Fuller 2009).

Pathway
According to Fuller (2003), *Channa marulius* was found in Maryland due to probable aquarium release.This species has been known to be cultured for food and/or aquarium fish trade (Courtenay & Williams 2004).It is highly valued throughout Asia for its taste, so it is likely spread through the live food trade (Helias, 2002).

Principal source:

Compiler: IUCN/SSC Invasive Species Specialist Group (ISSG)

Review: Expert review underway: Dr. Walter R. Courtenay, Research Fishery Biologist, Center for Aquatic Resources Studies, USGS Florida Integrated Science Center USA

Pubblication date: 2009-05-24

ALIEN RANGE

[4] UNITED STATES

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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).
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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 �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.
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