GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Neogobius melanostomus***

Neogobius melanostomus 正體中文

System: Freshwater

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae

Common name

babka bycha (Polish), guvid (Romanian), trevno popche (Bulgarian), bychok kruglyak (Russian), babka okragla (Polish), chornorotyj bychok (Russian), stronghil (Romanian), round goby (English), black spotted goby (English), Kruglyak (German), Schwarzmundgrundel (German), gobio pintato (Spanish), grundel (German), gobie â taches noires (French), babca neagrâ (Romanian)

Synonym

Gobius cephalarges , Pallas, 1814
Gobius chilo , Pallas, 1814
Gobius exanthematosus , Pallas, 1814
Gobius melanio , Pallas, 1814
Gobius sulcatus , Eichwald, 1839
Gobius lugens , Nordmann, 1840
Gobius weidemanni , Kessler, 1874
Apollonia melanostoma , Iljin, 1927
Neogobius cephalarges , Berg, 1949
Neogobius melanostomus , Berg, 1949
Neogobius melanostomus , affinis Berg, 1949
Neogobius cephalarges , Vasil'yeva & Vasil'ev, 1994
Gobius melanostomus , Pallas, 1814
Gobius virescens , Pallas, 1814
Gobius affinis , Eichwald, 1831

Similar species

Summary

Neogobius melanostomus is a bottom dweller found in rivers and near the shore of lakes, preferring rocky habitats with many places to hide. It preys on small fish, such as darters and the eggs of lake trout, and many other fish. Adult Neogobius melanostomus aggressively defend spawning sites and will occupy prime spawning areas, preventing native species from utilising these sites. This fish may out-compete native fish for food resources, due to its ability to feed in darkness. Neogobius melanostomus often eats bivalves that filter water and becomes a vector of bioaccumulation, with contaminants becoming passed on to the larger game fish or humans that eat them. There is little information on successful management options for this species.

view this species on IUCN Red List

Species Description
Charlebois *et al*. (1997) state that, \"*N. melanostomus* is a small, soft-bodied fish. It is most readily distinguished from all other freshwater fish in North America by the presence presence of a fused pelvic fin that forms a suction disk on the ventral surface. The body is brownish gray with dark brown lateral spots. Mature males are completely black during spawning and nest guarding, with yellowish spots on the body and median fins fringed in yellow or white. A large, oblong, black spot is usually present at the end of the first dorsal fin, beginning at the fifth ray. This spot is distinct but not unique, as sculpins often have a dark mark in this location. *N. melanostomus* without this spot have been found in Lake Erie (Cavender, Ohio State University, pers. comm.). Juveniles have a light border around the black spot.\"
Charlebois *et al*. (1997) describe *N. melanostomus* in detail as, \"scaled on the parietal region, nape, back (all), throat (all or most), abdomen, pectoral fin peduncles, and one quarter of the gill covers. Scales on the middle and anterior nape are cycloid (as are scales on the greater part of the gill covers and throat, pectoral peduncles, and part of the abdomen [Rudnicka, personal communication]). The head is as wide as or wider than deep; depth is 0.9-1.2 times the width. Head length is 22-23% of total body length. There are usually six, rarely seven, transverse suborbital series of pit organs. Ventral fins reach or almost reach the vent. The pelvic disk is 0.6-0.8 times the abdomen length. If present, the anterior membrane width is very shallow, with rounded, lateral lobes. The caudal peduncle depth is about two-thirds its length. The anterior dorsal fin has five to seven spines, usually six, and the posterior dorsal fin has one spine and 13-16 soft rays. The anal fin has one spine and 11-14 soft rays, and the pectoral fins have 17-20 soft rays *N. melanostomus* possesses upper and lower pharyngeal teeth, and the posterior teeth are smaller than anterior teeth (Pinchuk, 1992; Ghedotti *et al*., 1995). *N. melanostomus* lacks a gas bladder and chemoreceptors.\"

Lifecycle Stages
The Animal Diversity Web (2002) states that, \"Female *N. melanostomus* mature by 1-2 years of age and males at 3-4 years.\" Studies have shown that newly colonized round gobies in brackish waters and lakes are smaller, mature earlier, have a male biased sex ratio and are more short-lived compared with round gobies from marine (native) habitats (Corkum *et al.* 2004).

Uses
Neogobius melanostomus is fished commercially in the Black and Caspian seas. The species also is used as a bait fish, although this practise is often not permitted in regions where the fish is non-indigenous.

Habitat Description
Neogobius melanostomus is a bottom dweller in the nearshore region of lakes and in rivers, and prefers rocky habitat that provides lots of hiding opportunities. Although juvenile and adult round goby prefer rocky substrates, the fish also is found in fine gravel and sandy substrates in which they may burrow (Ray and Corkum 2001, in The Animal Diversity Web, 2002). Successful maintenance of all stages of the round goby in the laboratory requires vigorous aeration and a flow-through system (Corkum, personal observation). Steingraeber *et al.* (1996) report that, \"*N. melanostomus* prefer to reside among macrophytes or rocky substrate in littoral areas (Jude *et al.* 1992; Jude *et al.* 1995) but are not restricted to these habitats (Jude and DeBoe, 1996).\" Charlebois *et al.* (1997) go into great detail on the specific habitat preference of *N. melanostomus*. The authors state that, \"*N. melanostomus* occur on coarse gravel, shell, and sand in inshore areas to depths of 20m in the Black Sea and the Sea of Azov (Miller, 1986). In the Caspian Sea, *N. Melanostomus* occur to 70 m, and are often associated with eelgrass (*Zostera* sp.) (Moskal'kova, 1996). In the Kuybyshev Reservoir, *N. Melanostomus* occur in silted sand at depths of 5-10m and in river beds to 30m (Tsyplakov, 1974). *N. Melanostomus* also occur in lower and middle reaches of rivers, but only in slightly brackish or fresh water (Miller, 1986, but see \"Physiology\" section). During spring-autumn in the Black Sea, *N. Melanostomus* is found in slowly flowing rivers, lagoons, and brackish coastal water to 20m (Jude and DeBoe, 1996), but it migrates to deeper water (50-60 m) in winter (Miller, 1986). During spring, *N. Melanostomus* migrates to inshore areas of the northern Caspian Sea even while these areas are still partially frozen (Nikol'skii, 1954). *N. Melanostomus* prefers littoral areas where wave action maintains high dissolved oxygen levels and reduces the amount of decaying material. In the Gulf of Gdansk, *N. Melanostomus* is associated with stone/sand areas, mussel beds, marine structures, and sunken objects. In Puck Bay, Gulf of Gdansk, *N. Melanostomus* inhabits areas with a humus/mud/sand substratum overgrown with benthic flora (Skora, 1996)\".
Charlebois *et al.* (1997) state that in its introduced range, \"In the St. Clair River, *N. Melanostomus* are associated with large cobble to depths of 3m and macrophytes (e.g., *Elodea canadensis*, *Myriophyllum* spp. And *Potamogeton* spp.) in depths of 1.5-4.6 m. They also have been impinged on industrial screens at 6m depth (Jude *et al.* 1992; Jude *et al.* 1995; Jude and DeBoe, 1996). Fry were collected in *Chara* beds presumably where spawning occurred (Jude *et al.* 1995). Macrophytes and cobble provide large interstices for refuge and spawning (Jude and DeBoe, 1996), but *N. Melanostomus* apparently is not restricted to these habitats (Jude *et al.* 1992; Jude and DeBoe, 1996; MacInnis and Corkum, 2000). In Calumet Harbor (Illinois), *N. Melanostomus* were abundant on both cobble and sand, although adults were less abundant on sand than juveniles. *N. Melanostomus* also will move onto sandy beaches to feed at night (Jude *et al.* 1992). In the St. Clair River, there is an inverse relationship with depth and number of *N. Melanostomus*, but a direct relationship with depth and length of individuals, which may be due to gear bias (Jude *et al.* 1995). *N. Melanostomus* were not collected in shallow near shore areas of Lake St. Clair until May 8 in 1993 (T. Water =7.8ºC), but were abundant from shore to 5m on November 5, and in December trawls at 3, 5, and 7 m.\"

Reproduction
Murphy *et al.* (2001) state that, \"Males migrate from deeper waters to spawning areas in the spring, establish territories prior to arrival of females, defend a nest site to which females are attracted for spawning, and care for single or multiple batches of eggs (Moiseyeva and Rudenko, 1976; MacInnis and Corkum, 2000). As with other male gobiids [e.g., *Bathygobius soporator* (Tavolga, 1956)], male round gobies use visual displays (colouration changes and posturing) and acoustical signals when courting females (Protosov *et al.* 1965; Moiseyeva and Rudenko, 1976).\" The Animal Diversity Web (2002) states that, \"Female *N. melanostomus* spawn repeatedly (approximately every 20 days) from April until September while males guard the eggs and young.\" The authors go on to state that, \"Five hundred to three thousand eggs are deposited by the female on a hard substrate and are then guarded by the male until hatching.\" Pheromone signalling is crucial to mating behaviour in *N. melanostomus* (Corkum, 2004). Gill ventilation by reproductive males in response to steroids and to gonadal extracts from gravid females is dependent upon olfactory sensory input (Belanger *et al.* 2003). Accessory nasal sacs have the capacity to \"regulate the flow of odorant molecules over the sensory surface of the olfactory sensory neurons, possibly through a pump-like mechanism driven by opercular activity associated with gill ventilation\" (Belanger *et al.* 2003). Arbuckle *et al.* (2005) discovered that 5-ß-reduced androgens are produced in the islets of steroid-synthesizing glandular tissue of male round goby testes. The male round goby releases a sex attractant to which gravid females respond (Belanger *et al.* 2004). In a laboratory flume, gravid females spent significantly more time than non-reproductive females near the source of the reproductive male donor water (Belanger *et al.* 2004).

Nutrition
The Animal Diversity Web (2002) states that, \"*N. melanostomus* are voracious feeders, with a penchant for stealing the worms off an angler's hook. They also prey on zebra mussels, another Great Lakes exotic from the same native region. Young and eggs of other fishes, and even their own, as well as aquatic insects and invertebrates are choice prey. A complete lateral line system (a sensory system) allows them to feed in complete darkness.\"
Charlebois *et al*. (1997) state that, \"*N. melanostomus* is a benthic feeder. Its diet is composed primarily of crustaceans and molluscs, including zebra mussels. Polychaetes, small fish, goby eggs, and chironomid larvae also are eaten (Berg, 1949; Miller, 1986). In the Sea of Azov, *N. melanostomus* was the primary consumer of benthos, consuming up to 13% of the annual production. Its diet during the primary feeding period (spring-fall) was 90% molluscs, and during winter was 11-41.8% fish (mainly Clupeonella; Skazkina and Kostyuchenko, 1968). *N. melanostomus* of all sizes eat molluscs and crustaceans. Small- and medium-sized *N. melanostomus* also eat worms (presumably polychaetes), but only larger individuals eat other fish (Skazkina and Kostyuchenko, 1968; Kovtun *et al.* 1974). In North America, *N. melanostomus* also primarily consume benthic organisms. Other items in the stomachs were *Gammarus*, Ceratopogonidae, Ephemeroptera (*Caenis*, *Stenonema*, *Ephemera*, *Hexagenia* , *Baetis*), Odonata (*Macromia*), Diptera (*Atherix* pupae and larvae), Oligochaeta, Ostracoda, Decapoda (crayfish), and Trichoptera. Larger fish contained more chironomids and zebra mussels than smaller fish. *N. melanostomus* ingests zebra mussels intact; divers in the St. Clair River have observed *N. melanostomus* wresting zebra mussels from the substratum and swallowing them whole (Johnson and Lashbrook, 1993). *N. melanostomus* generally crushes the zebra mussels with its pharyngeal teeth, and shells are discarded before the soft body is swallowed (Ghedotti *et al.* 1995).\"

General Impacts
For details on the impacts of *Neogobius melanostomus* of this species please see *general impacts*

Management Info
For details on management of this species please see *management information*

Principal source: Fuller *et al.* 2005 *Neogobius melanostomus*
The Animal Diversity Web, 2002. *Neogobius melanostomus*

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

Review: Dr. Lynda D. Corkum, Professor Department of Biological Sciences University of Windsor Canada

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ALIEN RANGE

[1] ARAL SEA
[1] BELARUS
[1] LAKE ERIE
[1] LAKE SUPERIOR
[2] ATLANTIC - NORTHEAST
[2] CANADA
[1] LAKE HURON
[10] UNITED STATES

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52 references found for **Neogobius melanostomus**

Managment information

Aquatic Invaders of Belarus., 2007. Alien Species Database *Neogobius melanostomus*

Summary: This database is of alien aquatic animals inhabiting waterbodies of the Republic of Belarus. It allows to search the species by scientific taxonomy and to get information on their origin, distribution and potential ecological impacts. The database was composed in result of the analysis of literature published during the last century and authors unpublished data. One can find some general information on Belarusian waterbodies, history of construction and functioning of the interbasin shipping canals, links to related sites, etc. The site is under testing and only an English version is available, a Russian version is expected shortly.
The database is available from: http://www.aliensinbelarus.com/content/view/12/28/.
This page is available from: http://www.aliensinbelarus.com/index.php?option=com_database&Itemid=27&id=63&task=one_dat [Accessed 28 May 2007]

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]
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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 &#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]
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