

Evidence of the occurrence and reproduction of vimba bream (*Vimba vimba*) in the Nida River system

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Abstract. Once abundant in the Nida River, vimba bream (*Vimba vimba*) was not detected during extensive electrofishing surveys undertaken in the late 1960s, 1990s, or early 2010s. Irrespective, a few angler records of this species suggested that a small population of vimba bream might persist in the Nida River. Finally, several records from 2015, 2016, and 2017 confirmed its presence in this river system and indicated its successful reproduction in the middle reach of the river.

Keywords: biodiversity, critically endangered (CR) species, faunistic research, rare species, red list

Vimba bream, *Vimba vimba* (L.), is an anadromous cyprinid fish capable of undertaking long-distance spawning migrations as well as forming local non-migratory populations (Bontemps 1971). This species was once of great economic value. Until the 1950s, annual catches of vimba bream in the middle and lower Vistula River were 180 tons. Catches ranged between 100 and 160 tons until the end of the 1960s, and then they decreased sharply to

approximately 35 tons until the late 1970s. In the 1980s, these figures decreased progressively to about 4 tons. Current catches in the lower Vistula River do not exceed 1.5 tons annually (Backiel 1985, Wiśniewolski 1985, 1987, Dębowski 2018). This spectacular collapse of the vimba bream population is attributed mainly to overfishing, the degradation of riverine habitats from channel regulation and water pollution, and finally the dam at Włocławek (266 km from the river mouth) built in the late 1960s that blocks access to spawning grounds in the upper reaches of the Vistula drainage basin (Backiel 1985, Backiel and Bontemps 1996, Buras et al. 2004, Dębowski 2018). Currently, the species is listed as critically endangered (CR) nationally (Witkowski et al. 2004).

In the past, vimba bream ascended most of the right-bank and only some of the left-bank tributaries of the upper Vistula River (Bontemps 1969, 1971). The largest of these left-bank tributaries is the Nida River (152 km in length, drainage area of approximately 3,600 km²). Penczak (1971a) states that, according to local residents, vimba bream ascended this river in large numbers in the past. However, neither his survey undertaken in 1968–1969 (Penczak 1971b) nor subsequent investigations performed in 1998–1999 (Buras et al. 2001) and 2010–2014 (Klaczak and Nowak, unpublished data) detected the

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presence of vimba bream in the Nida River. Nevertheless, this species has been reported sporadically by anglers.

The first confirmed records of vimba bream were in 2015. A single young-of-the-year (YOY) individual was caught in the Czarna Nida River (the longest left-bank tributary of the Nida River) close to the village of Gaj (lat. 50.7572°N, long. 20.5052°E) on November 4, 2015. Another YOY was caught in the middle reach of the Nida River at the village of Stara Rudawa on December 10, 2015 (lat. 50.4131°N, long. 20.5792°E). Both YOY specimens were caught with small seine nets at sandbars. An adult female was caught by electrofishing in the middle reach of the Nida River at Motkowice on September 7, 2016 (lat. 50.6042°N, long. 20.4952°E). Another three adults (a single ripe female and two males) were caught in the same place on June 2, 2017 (Fig. 1).

Although vimba bream was not recorded in scientific surveys undertaken in the late 1960s, late 1990s, or early 2010s, the current reports of them concur with scarce anecdotal evidence from angler catches and confirm the presence of this species in the Nida River system. Records from the middle reach of the Nida River are evidence that a small, reproductive population of vimba bream persists there (either year round or only periodically during

spawning). This is highly plausible given that this river section is accessible from the Vistula River (there is a weir located approximately 1 km upstream from the Motkowice site that most probably prohibits any further migration). The middle and upper reaches of the Vistula River are inhabited by stationary freshwater populations of vimba bream, which undertake only relatively short potamodromous migrations for spawning (Backiel 1985, Buras et al. 2004). After being extirpated from the Nida River in the 1960s, the species has recolonized it. The record of a YOY from the Czarna Nida River is far more problematic as there are at least two major barriers between the middle reach of the Nida and Czarna Nida River inlet. One possible explanation is that some vimba bream spawners successfully overcame these barriers (e.g., during extremely high flows) and reproduced in the Czarna Nida River. Alternatively, some vimba bream might have been released unintentionally into this tributary during stocking with some other rheophilic species e.g., nase, *Chondrostoma nasus* (L.), or chub, *Squalius cephalus* (L.). The Polish Anglers Association chapter in Kielce does not stock vimba bream in the Nida River system at all because the species was not confirmed during ichthyological surveys, and it was not considered endangered or in need of any assistance in the drainage basin. Until more empirical material is gathered, the origin of vimba bream in the Czarna Nida River remains unknown.

Current reports of vimba bream in the Nida River underscore the urgent need of restoring degraded instream habitats, especially the inland delta of the middle reach of the Nida River (Korzeniak et al. 2004), and they also emphasize the importance of maintaining or restoring ecological continuity to river sections that are as long as possible and allowing for the spontaneous recolonization by extirpated or endangered species. Careful monitoring programs should be implemented and appropriate conservation measures

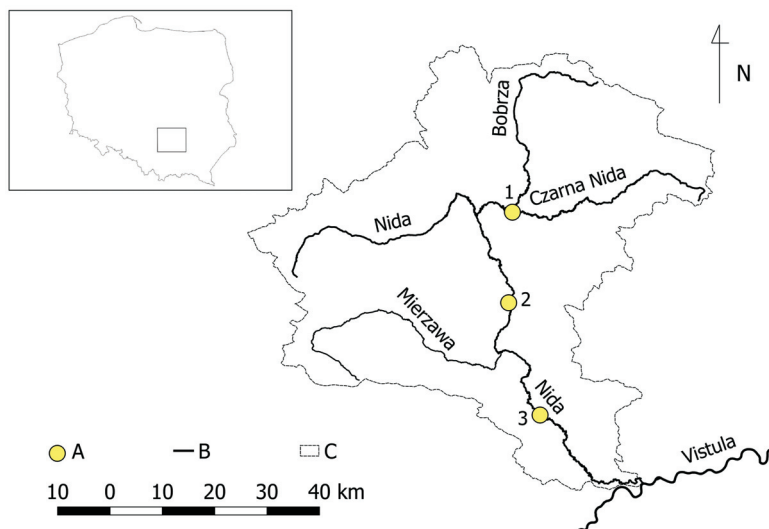


Figure 1. Confirmed records of vimba bream (*V. vimba*) in the Nida River system: 1. Czarna Nida River at Gaj; 2. Nida River at Motkowice; 3. Nida River at Stara Rudawa.

should be undertaken if required. Catching two YOY vimba bream specimens identified from thousands of juvenile fishes caught in the period of 2010–2015 indicates there is a need for very carefully sorting and analyzing small-sized material collected during field surveys. In the instances reported, vimba bream occurred syntopically with very abundant juvenile dace, *Leuciscus leuciscus* (L.), and more rarely with nase. Identifying adult vimba bream specimens is not difficult (anglers surprisingly often reported them as nase) because of several conspicuous characteristics: the protruding snout that has usual, dark pigmentation at the tip; the inferior position of the mouth; the scaleless keel between the pelvic fin insertion and the anal fin origin; the long anal fin (with 16–22 branched rays); and the scaleless dorsal midline between the occiput and the dorsal fin origin (Fig. 2). The same combination of traits distinguishes juvenile vimba bream from any other syntopic species, but their smaller body size makes identification more difficult. During the breeding season, adults can be recognized easily by the very dark to black coloration of most of the body with a yellow to orange abdomen and paired fins. This coloration can be observed in both sexes; however, in males it is usually far darker and intense (Bontemps 1971, Rolik and Rembiszewski 1987).



Figure 2. A vimba bream (*V. vimba*) specimen caught in the Nida River at Motkowice.

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