

## Present status and distribution of *Gobio* spp. in Slovenia

Meta POVŽ<sup>1</sup>, Suzana ŠUMER<sup>2</sup>, Milorad MRAKOVČIĆ<sup>3</sup> and Perica MUSTAFIĆ<sup>3</sup>

<sup>1</sup> U.B.Učakar 108, 1118 Ljubljana, Slovenia; e-mail: meta.povz@quest.arnes.si

<sup>2</sup> Ebra d.o.o., Cesta 5 maja 3E, 1370 Logatec, Slovenia; e-mail: suzana.sumer@ebra.si

<sup>3</sup> Faculty of Science, University of Zagreb, Department of Zoology, Rooseveltov trg 6, 10000 Zagreb, Croatia; e-mail: milorad.mrakovcic@zg.tel.hr, pmustafic@zg.tel.hr

Received 24 November 2003; Accepted 3 March 2005

**A b s t r a c t.** Five species of the genus *Gobio* have been recorded in Slovenia. *G. albipinnatus* Lukasch, 1933, *G. uranoscopus* (Agassiz, 1828), *G. gobio* (Linnaeus, 1758) and *G. kesslerii* Dybowski, 1862 inhabit watercourses of the Danube River in the eastern part of Slovenia (the catchments of the Sava, Drava and Mura rivers). *G. benacensis* (Pollini, 1816) inhabits Adriatic sea basin (the catchment of the Vipava river). The last one was found in Slovenia for the first time in October 2003. In the Red List of Slovenian Freshwater Fishes and Lampreys three species *G. albipinnatus*, *G. uranoscopus* and *G. kesslerii* are classified as vulnerable (V). These species were proposed to be added in Annex II of Council Directive 92/43/EEC.

**Key words:** gudgeons, threat, conservation

### Introduction

Until 1980, when the systematic research of the distribution of freshwater fish first took place in Slovenia, little was known about the distribution of genus *Gobio*. Most of the information available concerns the distribution of common gudgeon *G. gobio*, some sources refer to *G. uranoscopus* (H e c k e l & K n e r 1858, M u n d a 1926, S k e t 1967) but no information was available for whitefin gudgeon *G. albipinnatus*, sand gudgeon *G. kesslerii* and Italian gudgeon *G. benacensis*. According to data from the literature (M u n d a 1926, S v e t i n a & V e r c e 1969), stone gudgeon *G. uranoscopus* occurs in the Danube river basin. The first records of whitefin gudgeon were in 1983 (P o v ž 1984), of sand gudgeon in 1996 (H o n s i g - E r l e n b u r g & P o v ž 1999) and of Italian gudgeon in October 2003 (B u d i h n a & B e r t o k , pers. comm.).

### Material and Methods

Data on the distribution of the genus *Gobio* in Slovenia were compiled from the Slovenian Fish Land Register, managed by the Fisheries Research Institute of Slovenia since 1976, through literature, ichthyologic researches and from around 500 reports on fish kills, registered and examined by the same institute since 1980.

Distribution data were collected from the catchment areas of the Drava, Sava and Mura Rivers (Black Sea Basin) and from the Soča River (Adriatic Sea basin). The drainage area of the Drava River covers the north and south-east of Slovenia and measures 3,267 km<sup>2</sup> and its mean discharge is 297 m<sup>3</sup>.s<sup>-1</sup>. There are two dams and eight other weirs with hydropower plants on the river. The Mura River rises in Austria and empties into the Drava River in Croatia. Its drainage area in Slovenia is 1,386 km<sup>2</sup>, its mean discharge is 160 m<sup>3</sup>.s<sup>-1</sup>. On Slovene part of the river no

dams have been built as yet. The Slovene drainage area of the Sava River, which rises in Slovenia and empties in the Republic of Serbia and Monte Negro, measures 10,000 km<sup>2</sup>. The mean discharge in Slovenia is 155 m<sup>3</sup>.s<sup>-1</sup>. Four hydropower plants, one nuclear power station and one dam are in operation on the river but no dams and reservoirs have been built on its tributaries.

The Soča River is a coastal river of the Adriatic Sea Basin. Its drainage includes 2,390 km<sup>2</sup>, i.e. ca 12% of the 2,390 km<sup>2</sup> or 12% of the territory of Slovenia. The mean discharge in Slovenia is 83.5 m<sup>3</sup>.s<sup>-1</sup>. Four hydroelectric power plants are situated upstream of the river stretch.

## Results and Discussion

### *Gobio gobio* (Linnaeus, 1758)

This species inhabits the basins of the Sava, Drava and Mura Rivers (the Black Sea Basin). It occupies nearly all kind of riverine habitats with sandy substratum, from small mountain streams to large lowland rivers and even large lakes. In its natural area in Slovenian fresh waters it is a frequent fish species (P o v ž & S k e t 1990). It is sympatric with stone gudgeon in the Sava River, with sand gudgeon in the Kolpa and Lahinja Rivers, the tributaries of the Sava River, and with whitefin gudgeon in the Mura and Drava River basins.

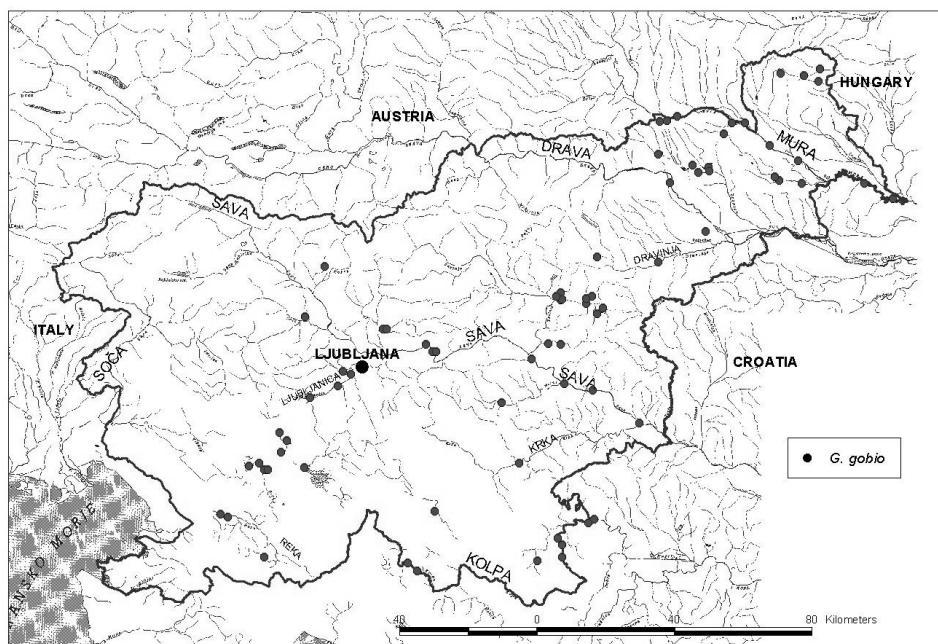


Fig. 1. Distribution of *G. gobio* in Slovenia.

### *Gobio benacensis* (Pollini, 1816)

Italian gudgeon inhabits Cisalpine Italy – in fact it is living in the catchment areas of the Po and Adige rivers and in other streams that empty in to the north part of Adriatic Sea. In Italy it was translocated in the Arno River basin in Toscana (Bianco & Taraborelli

1986). In 2003 it was discovered in Slovenia in the Vipava River one of the biggest tributaries of the Soča River. No one locality was known until now. In Slovenia this species inhabits the lower part of the Vipava River from the town Miren to the outlet in the Soča River. It occupies nearly all kinds of riverine habitats with sandy substratum and it is a frequent fish species in its natural area. Its distribution area in Slovenia is not known completely.

*Gobio albipinnatus* Lukasch, 1933

Whitefin gudgeon inhabits the Mura and the Drava Rivers and their tributaries. It inhabits mainly the streams with sandy or gravely bottom and well-oxygenated water. It is rare in the main stretches of the Mura and the Drava rivers but it is frequent in their tributaries, where it is sympatric with common gudgeon.

*Gobio kesslerii* Dybowski, 1862

In Slovenia this species was recorded for the first time in September and October 1996 in the Kolpa River (one of the biggest tributary of the Sava River) near the village of Gornji Radenci (Honsig-Erlenburg & Povž 1999). In October 1997, it was recorded in the Lahinja River, a tributary of the Kolpa River near Metlika. Previously sand gudgeon was mentioned only by Sket (1967) as potentially present fish without exact localities in Slovenian waters. The Kolpa River represents the most western margin of its distribution range in Europe. In the Slovene part of the catchment sand gudgeon is sympatric with common gudgeon and stone gudgeon. In the Lahinja River, only common gudgeon and sand gudgeon were caught (Povž et al. 1998). In both rivers it was quite numerous at the sites where it was recorded.

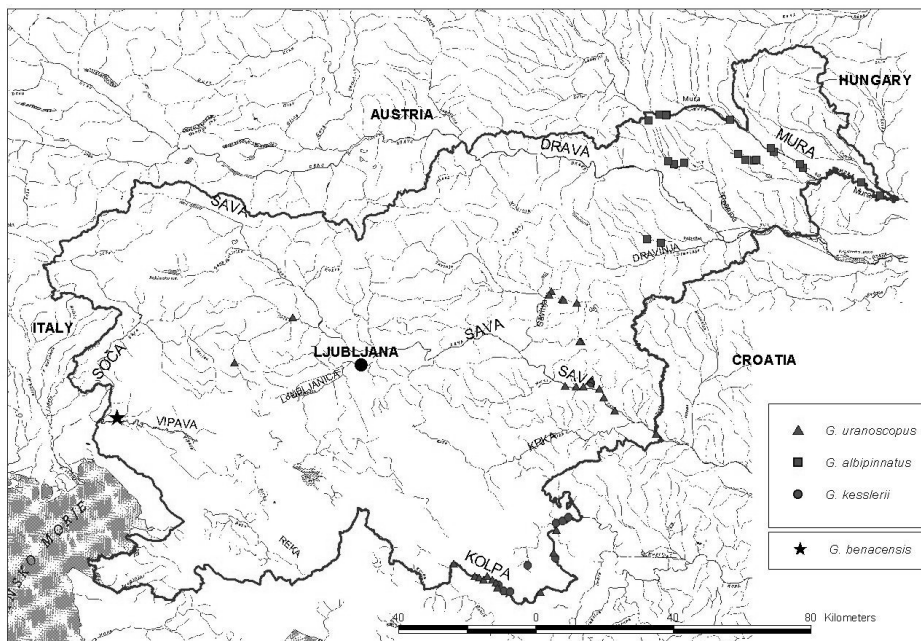


Fig. 2. Distribution of *G. uranoscopus*, *G. albipinnatus*, *G. kesslerii* and *G. benacensis* in Slovenia.

## *Gobio uranoscopus* (Agassiz, 1828)

Very limited data are available on its distribution area in Slovenia. Stone gudgeon was found only in the Sava River and its tributaries. The biggest populations are in the Kolpa River (the tributary of the Sava River) where it is sympatric with common gudgeon and sand gudgeon. In all other registered localities in the tributaries of the Sava River only single data are available on its distribution.

### Threatened status and conservation measures

The common gudgeon is not threatened at all because it very resistant species. In contrast, the Italian gudgeon's status is threatened and conservation measures in Slovenia have been totally unknown and undefined up to now because it was not recorded until 2003. All other gudgeon species i.e. whitefin, sand as well as stone gudgeon are strongly threatened and are protected by the Decree on the Protection of Endangered Animal Species (OG RS No.57/93). According to this act it is forbidden to destroy their habitats and spawning places, to catch and to take all these species from their natural habitats, or to release alien fish species in to their habitats (i. e. indigenous from the neighbouring water bodies and aliens from other countries and continents). As very endangered freshwater fishes of Europe, they are listed on the Annex II of Habitat Directive 92/43/EEC. In the Slovenian Red list they are assigned to the category of vulnerable (V) species. Sand, whitefin and stone gudgeons are threatened above all by intensive water pollution because they are bottom dwelling fish, and by improper water regulations. i. e. dams and weirs because of the consequent changes of all environmental conditions (water temperature, chemical parameters of the water, flora and fauna species compositions, etc.). For sand gudgeon and stone gudgeon, in addition to all the afore-mentioned precautions, the formation of reserves is one of the main conservation measures.

The data show that all species except the gudgeon and Italian gudgeon, which has been unknown in Slovenia up to now, are seriously threatened by pollution and by river regulations. A lasting solution to these problems is the formation of reserves plus the efficient protection of water quality and control over regulations in the broadest sense of the word. The latter have imposed fundamental changes in the hydrological regime, as well as changes in the living conditions for numerous, mostly rheophilous, fish species such as the representatives of the genus *Gobio* are. To preserve the threatened gudgeon species in Slovenia we urgently need to investigate their biology, ecology and habitat characteristics and their actual distribution. We do not know even the exact areas of all studied gudgeon species, none of which are mentioned in Annex II of Council Directive 92/43/EEC. This is mainly due to their small size, to their cryptic way of living and to the fact that they are not of interest to sport fishing. It is unbelievable that the Italian gudgeon was not discovered in Slovenia until the year 2003 in the river, where the sport fishing activities are strongly performed.

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