

THE BARRED MINNOWS (TELEOSTEI: CYPRINIDAE) OF ZIMBABWE: IS THERE CAUSE FOR CONCERN?

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Summary

Two species of barred minnow, *Opsaridium zambezense* and *O. peringueyi*, occur in Zimbabwe. The former is widely distributed in the Zambezi basin and some other rivers but *is now* absent from Lake Kariba and possibly some of its tributaries. The latter, which was only recently recognised as a distinct species and admitted to the Zimbabwean list, is much scarcer. It occurs in the Save and Limpopo catchments and there are only four specimens in the Natural History Museum of Zimbabwe collection. These specimens are all more than 40 years old and the lack of more recent ones suggest that *O. peringueyi* may be extinct, or close to extinction, in Zimbabwe. This situation may have come about through habitat alteration and drought, and emphasises the need for further monitoring of the current occurrence/distribution of fish species in the country.

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Introduction

The cyprinid genus *Opsaridium* Peters, 1854, includes about 11 species with a wide distribution across the African continent. They are distinguished from most other small cyprinid fishes by a distinctive pattern of vertical stripes and typically inhabit clear flowing streams. Until recently only the Barred Minnow *O. zambezense* (Peters) was recognised from Zimbabwe (Bell-Cross and Minshull 1988) but a revision of the southern African forms has revealed that another, the Southern Barred Minnow *O. peringueyi* (Gilchrist and Thompson) also occurs here (Skelton 1996). Thus, a new fish species can be admitted to the Zimbabwean list. *O. peringueyi* could prove to be one of the most endangered fishes in this country and may well be extinct or close to extinction in Zimbabwe, thus being the first indigenous species to be in this position.

chironomid and simuliid larvae, as well as on adult insects taken from the surface. In South Africa *O. peringueyi* inhabits clear flowing water in rapids or pools in rivers (Crass 1964, Pienaar 1968, 1978, Gaigher 1973), favouring shallow water about 15-50 cm deep with a temperature of 15-20°C (Schulz 1992, cited in Skelton 1996). Crass (1964) noted that it bred in summer in KwaZulu-Natal, reaching sexual maturity at a length of less than 7.5 cm. The presence of juvenile *O. zambezense* in receding flood waters in the upper Zambezi suggests that it spawns on the floodplains (Bell-Cross and Minshull 1988). It must also breed in the main stream of rivers such as the middle Zambezi since it is common in the main stream here but has not been collected in flooded pools off the main river (Kenmuir 1976).

Biology

Opsaridium are shoaling species most frequently found in clear waters in strongly flowing rivers and are especially common in rocky stretches and in riffles. They feed on benthic macroinvertebrates, especially

Distribution

O. zambezense has a wide distribution extending from the upper Kasai, a tributary of the Congo, through to the Okavango, Zambezi, Pungwe and Buzi rivers. In Zimbabwe, it has been recorded from the Zambezi and its tributaries, the Pungwe and

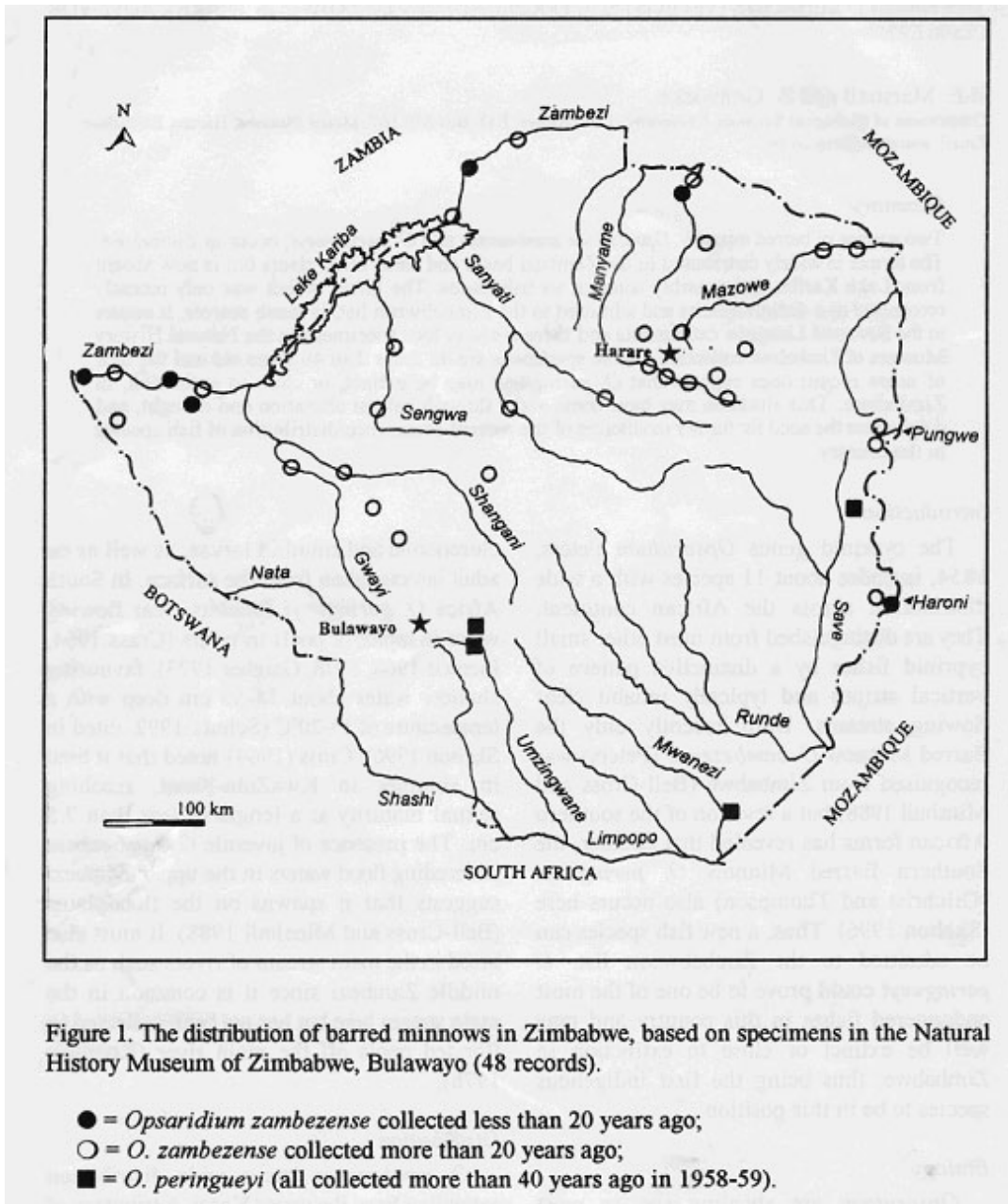


Figure 1. The distribution of barred minnows in Zimbabwe, based on specimens in the Natural History Museum of Zimbabwe, Bulawayo (48 records).

- = *Opsaridium zambezense* collected less than 20 years ago;
- = *O. zambezense* collected more than 20 years ago;
- = *O. peringueyi* (all collected more than 40 years ago in 1958-59).

the Haroni, a tributary of the Buzi (Figure 1). It does not occur in streams draining into the Odzi and Save Rivers from the western slopes of the Eastern Highlands. In the Save and Limpopo systems within Zimbabwe it is replaced by *O. peringueyi* which has been recorded from only four scattered localities (Figure 1). *O. peringueyi* occurs also in the Incomati, Umbeluzi and Phongolo systems in South Africa (Skelton 1996). A relict population exists in the Lephalala River, a tributary of the Limpopo in the Waterberg Mountains, South Africa (Kleynhans and Hoffman 1992). Old voucher specimens indicate that it formerly occurred more widely in the South African tributaries of the Limpopo but, apart from the Lephalala, none have been collected here recently (Skelton 1996).

Conservation

Because of their need for clear running water, the distribution and abundance of barred minnows in Zimbabwe has been adversely affected by the construction of dams on most rivers, which have drowned stretches of suitable habitat. Other threats include the loss of habitat through siltation and reduced river flows, as well as pollution from urban centres and agricultural chemicals. *O. zambezense* was relatively abundant in the Zambezi and Sanyati rivers prior to the creation of Lake Kariba (Jackson 1961). It is still common in the river above and below the lake but it is absent from the lake itself (Balon 1974, Mitchell 1976, Kenmuir 1983, Sanyanga *et al.* 1995). It seems to have disappeared from more than the area drowned by Lake Kariba since it is also absent from many smaller tributaries of the lake like the Mwenda and Naodza Rivers (Bowmaker 1973a, Marshall unpublished data). These rivers are highly seasonal in their flow, usually drying up completely in the dry season, and might never have supported a permanent population of these fish. Instead, their populations, like those of many other

species, would have been replenished by fish migrating from the Zambezi to breed (Bowmaker 1973b). This is no longer possible in any of the rivers draining into Lake Kariba because there are no stocks of *O. zambezense* that can replace fish lost during the dry season.

The situation in the larger tributaries is unclear. There are records of *O. zambezense* from the Sengwa River dating from 1965, i.e. after Kariba was created, but none were collected here during a survey in 1998 (Marshall unpublished data). It may have disappeared from the river during the droughts of the mid 1990s when its flow ceased. The museum records suggest that *O. zambezense* is still widespread on the Zimbabwean highveld (Figure 1) and this is certainly the case in the upper Manyame River near Harare (unpublished data). Nevertheless, environmental changes during the last two decades have reduced its habitat considerably and it is now absent from Lakes Chivero and Manyame, for example, even though it was abundant in the Manyame River before the lakes were created (Marshall 1982).

The situation of *O. peringueyi* seems to be much more critical. The disparity in the number of specimens of the two species in the museum collection (51 of *O. zambezense* compared to 4 of *O. peringueyi*) suggests that it has always been less abundant. Its absence from the Runde drainage, which was extensively surveyed by Rex Jubb, Frank Junor and others, is striking and tends to confirm its scarcity. Much more disturbing is the fact that no additional specimens have been collected since 1959-59 when the four available vouchers were collected.

The unpolluted, flowing, well-oxygenated water that this species requires for its survival is becoming increasingly scarce within its Zimbabwean range during the last four decades. The construction of reservoirs has drowned many suitable habitats, while siltation resulting from poor agricultural practices has caused the degradation of

virtually every river in the Save and Limpopo catchments (Campbell *et al.* 1989). Furthermore, the southern part of Zimbabwe suffered severely from drought during the 1990s and many rivers where this fish might have occurred dried up completely. There is a real possibility, therefore, that *O. peringueyi* may now be extinct or close to extinction in Zimbabwe. Its range in South Africa has also contracted markedly, especially in the tributaries of the Limpopo. Kleynhans and Hoffman's (1992) record from the Lephhalala River is the only recent one from the interior tributaries of that river and the species has been given the status of Indeterminate-Rare in that country's Red Data Book (Skelton 1987). Schulz (1992, cited in Skelton 1996) believes this should be changed to the more serious category of Vulnerable.

Conclusion

The status of the two barred minnow species in Zimbabwe is cause for much concern. Although the apparent decline in some populations may be an artifact, reflecting a lack of collecting during the last 20 years, there is no doubt that both species have become scarcer in Zimbabwe. The full extent of this decline is unclear and there is an urgent need to obtain more information, especially on *O. peringueyi*. It is sobering to report that a species recognised as being distinct only four years ago may already have been lost in Zimbabwe. This highlights the need to understand the changes that are happening in our rivers and the impact on their fish species. The pace of change will increase as the human population grows and makes increasing demands on water resources, while agricultural and urban development continues to degrade aquatic environments at an ever-increasing rate.

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