Macro- and microhabitats used by 0+ fish in a side-arm of the River Danube

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With 3 figures and 2 tables in the text

Abstract

Use of macro- and microhabitats by fish larvae and juveniles was studied during 1992 in a floodplain side-channel of the River Danube, 40 km downstream of Vienna, using a modified form of point-abundance sampling. Twenty-nine sampling points were defined within four habitat components (shallow bank, gravel-bank, steep bank and riprap), at which several biotic and abiotic variables were measured. Species richness was highest during July due to seasonal turnover of species, when early spawners such as Chondrostoma nasus and Vimba vimba were migrating from nursery grounds and later spawners such as Gobio gobio and G. albipinnatus were immigrating to new nursery areas. The shallow bank had the highest species diversity and was most important for older larvae and juveniles. The steep bank had the greatest number of young larvae, mainly Abramis brama, Rhodeus sericeus and Blicca bjoerkna, but species richness decreased considerably during the summer. In the riprap, fish associations were characterised by varying abundance of eurytopic species. Ontogenetic shifts in habitat were observed. Larvae and juveniles of rheophilic species (C. nasus, Leuciscus leuciscus, G. albipinnatus, G. gobio) were restricted to shallow banks and gravel-banks. Our results provide important information on the autecological requirements of floodplain fishes, useful for the development of criteria for river restoration and/or enhancement.

Introduction

Floodplain ecosystems are characterised by a high variability in hydrological conditions, which results in high environmental heterogeneity. As demonstrated by COPP (1992b) and COPP et al. (1994) it is important to examine habitat use in a hierarchical manner. Until recently, the evaluation of species-environment associations in young fish of floodplain ecosystems has concentrated on the whole floodplain system (Copp 1989, Penaz et al. 1991, Copp 1992b, Copp et al. 1994). Since the disjunct nature of floodplains is reflected in a series of reproductive zones of fishes (Copp 1989), assessing species-environment associations in young fish of floodplain ecosystems has to take into account these patches of disjunct spawning habitats. Investigating the associations on a lower level of perception (cf. Copp 1992a) focuses on habitat selection of young fish more precisely. Small-scale studies consider differing habitat components that are actually available to fish of 0+ years of age, with a limited swimming range in their early stages.