Exchange rate and small-scale movements of fish between a river and its backwater

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With 7 figures and 1 table

Abstract: Movements of four freshwater fish species, pike (Esox lucius), roach (Rutilus rutilus), rudd (Scardinius erythrophthalmus) and perch (Perca fluviatilis), were studied in a backwater (1.2 ha) of the River Morava (Czech Republic), consisting of five pools permanently connected to each other and to the river. Pool-specific fin-clipping was used to mark fish collected by electrofishing at monthly intervals (March to November 1995). Of the 367 fish marked, 85 were recaptured, giving a return of 23.16%. Pike and rudd tended to remain in their home pool, with rudd showing higher activity within the backwater than pike. Roach and perch were not resident in the backwater. The ratio between two population estimates, the Schnabel and Seber & LeCren estimates, was used to calculate an exchange rate of fish movement between the river and the backwater. Immigration and emigration was greater in roach and perch, having an average exchange rate of 90–96% per month and a low number of recaptures. In contrast, pike and rudd were less active, with an exchange rate of 61–72% per month.

Introduction

It has been hypothesized that backwaters provide important spawning and nursery habitats (BALON 1975, REIMER 1991). However, it is unclear if these backwaters support distinct populations, or if fishes periodically move to and from the river backwaters. Therefore, little is known about the level of connectivity between fish populations in backwaters and rivers (TAYLOR 1997). Tags, micro-chips, or other marking methods, such as fin-clipping, have been used to obtain information on fish spatial distribution and migration (NORTHCOTE 1984, PITCHER 1993, CLOUGH & BEAUMONT 1998). Typical migrants have