Microhabitats of brown trout when feeding on drift and when resting in a lowland salmonid brook: effects on Weighted Usable Area

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With 7 figures and 1 table

Abstract: Summer habitat preferences by brown trout (10–20 cm fork length) were determined by daylight and night dive sampling in the Saint Sauveur brook, a tributary of the River Scorff (Brittany, France). Habitat change was analyzed from night and day sampling. At the geomorphological unit scale, fish preferred riffles during daylight hours and pools at night. According to behavioural data, night and day locations in the channel depended on the two activities: resting (night samples) and feeding on drift (daylight samples). Suitability curves drawn at the microhabitat scale showed differences between day and night, in terms of water depth (25–45 cm by daylight, 40–55 cm at night), velocity (15–45 cm/s by daylight, 0–15 cm/s at night) and substrate particle size (gravel, cobble and stones by daylight, silt and sand at night). Based on these habitat suitability curves, Weighted Usable Area was computed by EVHA, the French version for the Physical Habitat Simulation system. Results show that WUA varied in magnitude from 1 to 9 between night and day, depending on stream discharge. In addition, the need to modify the “Standard” Habitat Suitability Indices (HSI) is emphasized, owing to the differences in the shape of the suitability curves between Standard HSI and Feeding HSI according to water velocity.

Introduction

Fish diel activity can be summarized by the alternation of periods of foraging and inactivity during which resting, comfort and hiding behaviour are expressed (HELFMAN 1993). Therefore succession of day and night is often an environmental factor that gives rhythm to activity (MÜLLER 1978), and most species are diurnal, nocturnal or active at twilight. In a lotic environment, diel