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ABSTRACT

From 1995 to 1998, brown trout (28-43 cm, 234-995 g; N=9) from the Aisne stream (Belgian Ardennes) were tagged with surgically implanted radio transmitters equipped with activity circuits, and their activity patterns were studied over twenty-eight 24-h cycles at all seasons. Except during spawning runs (net daily journeys up to 7.2 km), the longitudinal extension of the trout's daily activity area was almost always less than 100 m, and was independent from fish size. Activity budgets were proportional to day length, with secondary influences of water temperature (daily thermal range) and level, that varied between individual fish, depending on the habitat structures inside their home range. During autumn and winter, trout were essentially active during the night and twilight periods. During spring and summer, they showed most variable activity rhythms, which were dependent on the drift rates of aquatic and/or terrestrial invertebrates, either on any item for generalist individuals, or on specific items for some others. Spatial variations in drift rates also influenced the choice of foraging sites. In heterothermal environments such as confluences with tributaries, trout were also shown to exhibit behavioural thermoregulation when the water temperature in the stream was warmer or colder than the optimum. These findings illustrate the extremely high variability between the foraging tactics of individual trout, and raise fundamental questions on the adaptive significance of this behavioural polymorphism.