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Transactions of the American Fisheries Society 1984;113:1–32**Foraging Behavior of Free-Ranging Wild and Hatchery Brown Trout in a Stream**

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Abstract.—Wild brown trout *Salmo trutta* in a fertile, high-conductivity stream in central Pennsylvania were observed from camouflaged towers for three consecutive years in order to quantify the diurnal feeding and social behavior of undisturbed adults. The foraging behavior observed was characterized in general as one of net energy maximization effectuated principally by cost minimization. Individuals ranging in age from young of the year to 8 years spent 86% of foraging time in a sit-and-wait search state, used discrete, energy-saving foraging sites year after year, and fed mainly off drift, taking less than 15% of their food items directly off the bottom. Feeding rates decreased with age, were highest in spring and fall, and showed little effect of time of day except for short peaks at dusk in May and June. The home range of most individuals was established in the first or second year of life and changed little thereafter. The mean size of the home range of individuals was 15.6 m² and decreased slightly during the first 4 years of growth. No individual had exclusive use of any home range and no clearly defined territory could be described for any fish. Rather, the social structure evidenced is best described as a cost-minimizing, size-dependent, linear dominance hierarchy of individuals having overlapping home ranges. There was no apparent correlation between dominance and site selection with respect to distance to cover or feeding rate. Use of overhead cover ranged from 17% or less of daylight hours for wild brown trout of age-group 2 to no more than 43% for age-group 5. Length was asymptotic at 40 cm. A rectangular hyperbola described well the overall growth curve of fish in this population, half of the asymptotic length being attained at the age of 23 months. Hatchery brown trout, introduced for experimental purposes, fed less, moved more, and used cost-minimizing features of the substrate less than wild trout. It is postulated that high energy cost is a major cause of mortality among hatchery-reared brown trout stocked in streams, that at high population densities foraging sites are limiting factors, and that growth rate of drift-feeding salmonids is density-independent.

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