

## ABSTRACT

Within populations of stream-resident brown trout, there are both mobile and sedentary components. Larger brown trout may range further to reflect a piscivorous, mobile-feeding strategy. Smaller fish may range less to reflect a drift feeding, sit-and-wait strategy. I tested the hypothesis that range of movement increases with fish size in the South Branch Au Sable River, Michigan. I measured range of movement (daily for two summers; biweekly for one fall/winter) and daily activity patterns (one summer) for two- and three-year-old brown trout implanted with radio transmitters. Summer range of movement was significantly greater for larger brown trout, 43 m for fish larger than 30 cm and 13 m for fish smaller than 30 cm. Range of movement was much greater and more variable in fall/winter (950 m average & 0-4500 m range) than in summer (29 m average & 5-110 m range). I believe range increased in fall/winter to reflect life history changes related to spawning or overwintering migrations, and high variability in ranges was a consequence of the timing and duration of tracking. I monitored brown trout only during the day in fall/winter (most movements in summer were recorded at night), and less frequently than in summer. Fish were usually located deep in white cedar log jams during the day and away from cover at night. This behavior pattern suggested brown trout were diurnally inactive and nocturnally active, which was confirmed by brown trout monitored specifically for daily activity patterns. Food availability, predation risk, and water temperature appear to be three factors that influence the daily activity patterns of brown trout in the South Branch Au Sable River, Michigan.