ABSTRACT

Large brown trout and walleye often make long-range movements associated with foraging or spawning. Dams may affect fish movements by presenting physical barriers to migration and by altering habitats available in a reach. Radiotelemetry was used to monitor seasonal and daily movements of eight large brown trout and eleven large walleye in the Au Sable River between Mio and Alcona dams. The purposes of this study were to estimate the long-range movements of both species and to compare specific habitat characteristics for brown trout and walleye.

Eighty-six percent of all brown trout locations occurred within the first 13 km of Mio Dam. Summer (May to August) range varied from 100 to 9,252 m; winter (September to April) range varied from 64 to 8,705 m. Between September and November, three brown trout made spawning migrations of up to six kilometers, then all brown trout tracked during winter remained within their summer range. Brown trout selected low velocity (<0.5 m/s) areas with silt substrates during summer and winter; they selected moderate velocities (0.5-1.0 m/s) during September, October, and November.

Seventy-one percent of all walleye locations occurred within the first 25 km of Mio Dam. Summer range varied from 97 to 36,446 m; winter range varied from 23,266 to 46,629 m. Walleye traveled upriver in April or May and presumably spawned near Mio Dam. In 1996, three of four walleye remained in the river until late August. In 1997, all nine walleye tracked returned to Alcona Pond by early June. Low river temperatures during May and June 1997 may have forced walleye to return to Alcona Pond. While in the river, walleye occupied low velocity areas with silt substrates.

Walleye often occupied the first 25 km below Mio Dam but were seldom found in the lower section. All walleye overwintered in Alcona Pond.

Both species demonstrated regular patterns of daily activity. Brown trout were most active at sunrise and sunset, often moving only short distances between low-velocity resting sites and high-velocity feeding sites during these periods. Activity of riverine walleye increased at dusk and remained high during night. Walleye occasionally foraged 1-2 km away from daytime resting sites. Walleye were often present near stocking sites for fingerling brown trout during May and June, suggesting potential for predatory interactions.

Maximum potential for interactions between these two species occurs within the first 25 km of Mio Dam during summer. In this reach, both species used low velocity sites for daytime resting and increased foraging activity between dawn and dusk. Competition for food and resting sites and walleye predation on small trout may occur in this area.