

Home Range and Habitat Preferences of Adult Lake Trout (*Salvelinus namaycush*) in Lake Opeongo, Algonquin Park, Ontario

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The description of home ranges is important for the determination and protection of key habitat areas. Movements of adult lake trout (*Salvelinus namaycush*) have been under investigation in Lake Opeongo, Algonquin Park, for three consecutive years. A total of twenty-four fish (mean fork length 565 mm, range 449-770) have been implanted with acoustic transmitters. The objective of this research was to determine the extent of home ranges and the habitat preferences of adult lake trout in a large (58.6 km²) inland lake system. Home ranges (95% Kernel area) for individual adult lake trout in Lake Opeongo ranged from 0.8 to 10.1 km² and core areas (50% Kernel area) ranged from 0.2 to 2.2 km² (n=20). In summer, home range sizes ranged from 0.4 to 9.0 km² and core summer ranges were from 0.07 to 2.3 km². In the year 2000, seasonal use of summer core areas was examined. Adults tend to use their summer ranges to some extent in the spring, as 78.5% of spring fixes fall within summer ranges. In the fall, only 38.1% of fixes fall within the summer ranges, and these tended to fall on the edges of summer use area. Only two of six fish visited their summer core areas during the fall (6 fixes of a possible 286). The importance of site selection in the reproductive ecology of lake trout is well documented. Using an existing model of sedimentation processes in lakes (Rowan *et al.* 1992) and a geographic information system (GIS), we mapped the extent of erosive habitat in the lake. Habitat variables (slope, depth, and fetch) were summarized for each fish location during the spawning period in each year. Positions of lake trout were in areas of mean fetch equal to 1.5 km, mean depth of 5.1 m, and mean slope of 10.6% (n=50 fixes). We then used a GIS to identify areas that matched those habitat values (mean +/- 1 SD) to identify potential spawning areas. This method correctly identified 19 of 21 known spawning sites, as well as some areas used by spawning females in an earlier telemetry study (MacLean *et al.* 1981). Depths of traditional fall netting sites are shallow (3.1 m) compared to areas in which telemetered lake trout were found during evenings of the spawning period. The implications of this result are significant in terms of future assessment and restoration of reproductive habitat for lake trout.

References

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