

SPATIAL SCALES OF MOVEMENT OF RELEASED HATCHERY-REARED AND WILD ATLANTIC COD

Torstein Pedersen*, Els Cuveliers and Erik Berg

Department of Aquatic Biosciences, The Norwegian College of Fisheries Science
University of Tromsø, Breivika, N-9037 Tromsø, Norway
Torstein@nfh.uit.no

The movement patterns of released fish determine the geographical scale at which a population may be enhanced, and also affect the management strategies of wild populations. We attempt to investigate whether; i) movement patterns differ between hatchery-reared and wild tagged cod; and ii) movement patterns differ between geographical regions.

Detailed analysis of displacement distances and movement patterns from a large mark-recapture experiment in northern Norway were carried out from 1990 until 2002. In this experiment 19,578 wild and 25,929 reared cod were tagged; 2,877 wild and 2,073 reared fish were recaptured. The displacement distances were highly skewed and the results suggest that the cod move within home-ranges. The frequencies of these displacement-distances is well described by a log-normal distribution (Figure 1). The results from this experiment are compared to other studies using a new method for quantification of movement patterns based on fitting log-normal distributions to published displacement data.

Reared cod that are released at a small size (< 27 cm in length) and young age (< 1 year of age) seem to have similar movement patterns as wild cod. Differences in movement patterns between hatchery reared cod and wild cod were observed for cod that have been reared for more than a year in captivity. This suggests that learning during early life may be important for the formation of home-ranges and that deprivation of the natural environment during this period may impair, at least temporarily, the home-range formation. Regional differences in movement patterns of released reared and wild cod are quantified and the consequences for management are discussed.

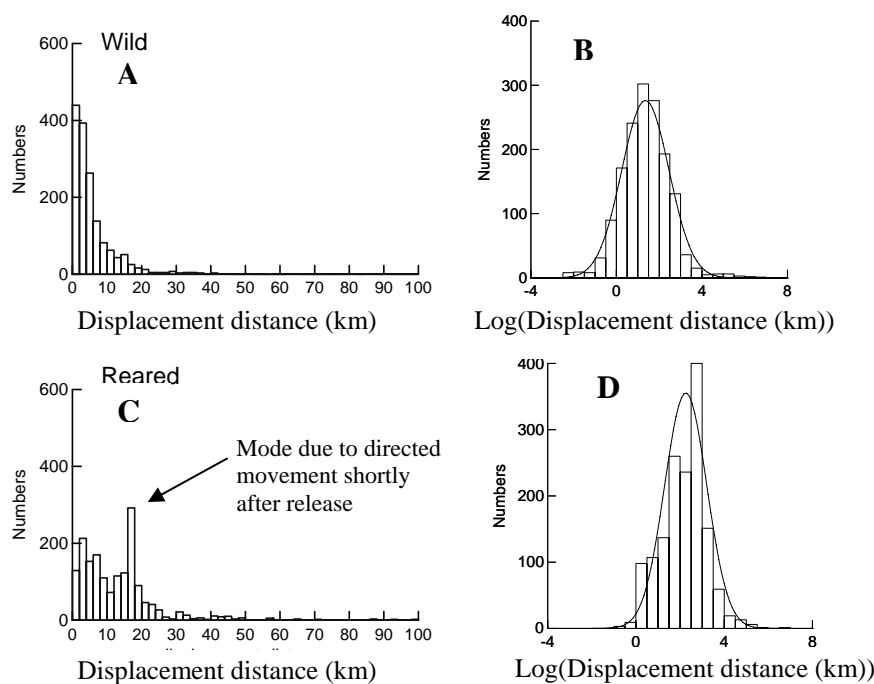


Figure 1: Overview of displacement distances of tagged wild (A & B) and hatchery-reared cod (C & D). The reared cod were released 1.5 year after hatching. Note the good fit to a log-normal distribution for wild cod and the much poorer fit for the reared cod due to directed movement shortly after release.