



# Heterogeneity of space use in tactics in salmon parr along breeding season in relation to the individual maturity level

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wild-spawned kelts released back to their river of origin (Middle and Baddeck rivers, NS, Canada). Individuals were followed for up to two years through their downstream river migration, estuarine residence, ocean entry, and subsequent return as repeat-spawners. Compared to wild-spawned counterparts, hatchery-spawned kelts had significantly higher stress levels and potentially altered immune states, and exhibited earlier freshwater-exit and elevated estuarine mortality. Furthermore, survival to repeat-spawning was 0% and 6.5% for hatchery-spawned and wild-spawned kelts, respectively. Given that female repeat-spawners are generally large and have high fecundity, our findings suggest that a reduction in iteroparity as a result of hatchery practices could have population-level consequences. These repercussions should be considered in current conservation and management practices for iteroparous salmonid species.

### **Heterogeneity of space use tactics in salmon parr along breeding season in relation to the individual maturity level**

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Maturity leads to a changeover of focal resources, switching from trophic to breeding habitats and food to potential mates. Given this change of focal resources and their spatio-temporal distributions, maturity may affect space use. Body condition may also impact space use when individuals compete for resources. Aims of this study were to link space use to the maturity level and body condition of Atlantic salmon parr. We monitored the daily positions of 40 one-year parr by radio-tracking them throughout the spawning season, in a 2.5km river section where nests were mapped. Mature individuals covered both a longer upstream (1.4 vs 0.5 km) and total distance than immature (3.2 vs 1.3 km). Longer mature individuals, but not those in better condition, moved further upstream. Finally, the ability of mature individuals to resettle increased their probability to encounter a nest. This study is the first documenting space use of mature parr at a broader scale than the direct vicinity of nests. These results suggest mature parr have a potentially higher impact than expected on genetic diversity and life history diversity. Such data are also helpful to estimate the energy costs associated with movement of mature parr, besides costs of gonad maturation.

### **Understanding Effort: Consequences of delayed movement for both upstream and downstream passage of Atlantic salmon at barriers**

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