Popular science summary of the PhD thesis

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Title of the PhD thesis	Surviving the Journey: The migration of smolts from river to sea
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Science summary

Migration allows animals to exploit resources in different environments but comes with great risks. For Atlantic salmon (*Salmo salar*) and brown trout (*Salmo trutta*), the migration from river to sea as smolts (i.e., juveniles) can be particularly dangerous, and with high mortality. Because the number of smolts entering the sea directly affects how many adults return to spawn, boosting their survival is key to supporting wild populations.

In my thesis, I tracked Atlantic salmon and brown trout smolts using acoustic telemetry in rivers across Denmark, Ireland, and Northern Ireland to uncover *where* and *why* smolts die. I found that during-migration capture in screw traps - which interrupts the smolts' migration - did not impact migration success, supporting the use of trapping in research and monitoring. I also revealed that Atlantic salmon and brown trout have similar river migration but exhibit behavioural differences in fjords: Atlantic salmon maintained their speed to reach oceanic feeding grounds, while brown trout slowed down to forage in the fjord. Moreover, I identified high predation at a narrow river constriction downstream of a smolt counting facility used to estimate marine survival and track population trends, suggesting that some mortality attributed to the sea may in fact occur in freshwater. Lastly, I found that wetland restoration did not affect smolts' survival, likely due to the preservation of a well-defined river channel.

Together, these findings highlight how habitat, predators, and human activities influence smolt survival. As humans continue to alter the ecosystems that migratory animals rely on, identifying key threats to survival is essential to guide targeted management efforts and effectively support populations.