

21. Response of migratory fish populations to improved connectivity and habitat restoration

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Man-made barriers between marine and freshwater environment and fragmentation within river basins limit dispersal and habitat availability of migratory fish species worldwide. These structures also affect discharge patterns, river morphology, sediment transport, riparian and aquatic vegetation, and other cascading effects, with potentially negative effects on habitats for migratory fish species. Most research projects study the impact of habitat quality and restoration on fish populations locally. However, studies addressing the integrated impact of connectivity in combination with habitat restoration at catchment scale are rare, thereby hampering the setting and achieving realistic restoration targets. The current study aims to fill this gap by using telemetry in combination with habitat monitoring and fish sampling. The research objective is to determine to what extent improved connectivity and restored habitats benefit migratory fish species, as well as which bottlenecks still obstruct fish movements along an entire sea to source gradient in the heavily modified Westerwoldse Aa (The Netherlands). The specific aims are to evaluate 1) what developments took place during 30 years of improving the ecological quality of the catchment area, 2) whether the lower part of the stream is a non-physical barrier to the dispersal of diadromous and/or rheophilic fishes, 3) whether the slow-flowing/stagnant lower part of the stream offers suitable habitat for eurytopic diadromous species, and 4) whether variability in environmental conditions within the Dollard estuary pose temporal non-physical barriers for diadromous fish species.