River connectivity reestablished: effects and implications of six weir removals on brown trout smolt migration

Today's river systems have been extensively modified, requiring us to rethink how we approach the management of these important ecosystems. We evaluated the effects of removing 6 weirs in River Villestrup (Jutland, Denmark) on the smolt run of brown trout (Salmo trutta) over the course of 12 years. During 5 of these years, we evaluated the number, size, and timing of smolts during their downstream migration. We found an increase in smolt output following the weir removals, along with a decrease in average length and indications of an earlier peak migration. Our results suggest that barrier removal has led to an increase in spawning success by adults, fry survival, recruitment, and smolt migration success. Weir removal is therefore a viable management approach to restore connectivity in freshwater streams and rivers, which promotes the passage of smolts as they migrate to marine environment.

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