

# Displacement of hatchery trout in a small creek in Southern Switzerland: the role of water discharge, water temperature and light pollution

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## Abstract

Fish stocking to enhance freshwater fisheries is a common practice in many countries. Little is known, however, on the real effectiveness of these practices in small creeks in spite of the high efforts and investments required. The movement of 998 subadult/adult hatchery brown trout released in a small tributary of Lake Lugano (i.e., Laveggio creek, Ticino Cantone, Switzerland) was studied by passive telemetry. Hatchery fish were tagged with Passive Integrated Transponders (PIT) tags and detected by a submersible monitoring antenna anchored to the streambed in a pass-over orientation. The number of fish detected daily by the antenna was analyzed in relation to the daily water discharge and water temperature, to search for similar patterns in their fluctuation over time. Effect of light pollution on fish movement was also investigated. Among the environmental variables tested, only water discharge displayed a significant relationship with fish movement, with the highest number of fish detected during periods of high-water flow, occurring after heavy rains. No significant relationship was found with water temperature and light pollution. High-water discharge events were probably the main reason behind the steep decrease in hatchery trout abundance over time in our study site. Such events contributed to the poor effectiveness of restocking actions in this small tributary, providing further evidence against stocking strategies based on subadult/adult fish.

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