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Swimming Capabilities of Arctic Grayling

Arctic Grayling, *Thymallus arcticus*, is a fish species native to Montana. The last vestige of this Fish of Special Concern is found in the Big Hole River drainage in Montana. One reason for its decreased presence appears to be barriers to mobility. In order to facilitate mobility in streams with artificial barriers, such as low-head dams at irrigation diversions, one critical factor is the fish's swimming ability. In this study, fish were placed singly in a variable-flow swim chamber. The flow velocity was increased until the fish could no longer hold its position and was swept downstream by the current. The velocity at which this occurs is referred to as the sprint speed or Usprint. The US Fish and Wildlife Service Bozeman Fish Technology Center maintains a swim chamber and was host to this experiment. A group of forty fish, all hatchery-raised in a constant flow environment (artificial stream), was separated into two groups of twenty fish each. The first group, Cohort 1, was subjected to the experiment once per week for three consecutive weeks, beginning immediately after their removal from the artificial stream. The second group, Cohort 2, was tested one time in the swim chamber, sixteen weeks after removal from the artificial stream. Each fish was placed in the chamber at a flow of low velocity and then, at regular intervals, the flow was increased until the fish impinged on the screen at the back of the chamber. The average Usprint for both cohorts over all trials was 5.41 ft/s. Cohort 1 (all trials) had an average Usprint of 5.28 ft/s, and Cohort 2 had an average Usprint of 5.80 ft/s. There was not a significant difference in Usprint between the two cohorts. There was no apparent trend in Usprint between the successive trials using Cohort 1.

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