

Injury and immediate mortality associated with recreational troll capture of bull trout (*Salvelinus confluentus*) in a reservoir in the Kootenay-Rocky Mountain region of British Columbia

Lee F.G. Gutowsky¹, Philip M. Harrison², Sean J. Landsman¹, Michael Power², Steven J. Cooke^{1, 3}

¹ Fish Ecology and Conservation Physiology Laboratory, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario K1S 5B6, Canada

² Department of Biology, University of Waterloo, 1200 University Ave., Waterloo, Ontario N2L 3G1, Canada

³ Institute of Environmental Science, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario K1S 5B6, Canada

Published: Fisheries Research 109 (2011) 379-383

Summary

- This study evaluates hooking injury and immediate mortality occurring in bull trout in a reservoir in the Kootenay-Rocky Mountain region of British Columbia, where regulations permitted anglers to use both barbed and barbless hooks.
- It is the first study that examines hook-type issues in freshwater troll fisheries and the first published estimate of hooking mortality for bull trout, which is an imperilled species.
- Although immediate mortality was very low, the effects of recreational fishing practices on mortality of bull trout warrant further investigation due to the high incidence of bleeding and foul hooking.

Context

Bull trout are a popular recreational sport fish that are imperilled despite the fact that both the species and its habitats are protected by a variety of legislation. Threats to bull trout populations include habitat alteration, introduced species and recreational fisheries exploitation, which is the least studied threat. There are insufficient studies on hooking injury and immediate mortality for adult bull trout, but some models suggest that even low hooking mortality rates ($\leq 10\%$) would be sufficient to render bull trout populations extinct in places. Knowledge of hooking-induced injury and mortality would thus be useful to determine the risk of different angling activities.

Several factors can influence the fate of fish following an angling event, including hooking location and depth. In an attempt to address hooking issues, angling gear restrictions have been introduced. The researchers assessed hooking injury and immediate mortality of adult bull trout in the study reservoir. Assessing these factors is important, as such data indicate the consequences of catch-and-release in a troll fishery. The data can be used to manage these fish and provide anglers with strategies for reducing injury and mortality, thus improving the welfare of fish.

Additionally, the data suggest that fight duration has an effect on equilibrium (the ability to remain upright) upon landing and that injury is common. Therefore, there may be an advantage to using heavier gear to reduce fight duration, or advantages to spending more time recovering exhausted fish. Trolling resulted in negligible immediate mortality, which is believed to be due to the cool water temperatures during capture. As even low levels of hooking mortality could make recreational fisheries for bull trout unsustainable, the researchers concluded that efforts should be made to quantify hooking mortality relative to a broader range of environmental conditions, gear types, and angler behaviours.