Environment Agency

Evidence

Impact of catch and release angling practices on survival of salmon

This report is an independent literature review undertaken by the Hull International Fisheries Institute to identify measures to maximise the survival of Atlantic salmon (*Salmo salar*) caught and released by anglers.

The review employed electronic search engines, including Web of Science, Google Scholar and Scopus, to identify scientific literature and other materials related to catch and release (C&R) fishing, with specific focus on salmonid species. The searches also used the snowballing strategy to pick up non-indexed sources of literature, especially grey literature.

The adoption of C&R practices by anglers has resulted in a reduction in exploitation of salmon by rod fisheries over the past 2 decades; the percentage of fish being released by those fishing with a rod reached 79% in 2015 compared with just 10% in 1993.

For C&R to be an effective fisheries management tool, released fish must survive and go on to successfully reproduce. Studies in Atlantic salmon have demonstrated that survival rates following catch and release angling can be high. There is also evidence that sub-lethal impacts, such as impaired breeding performance, are also low. This supports catch and release as a viable fisheries management approach for reducing the exploitation of salmon by rod fisheries.

However, some factors can influence the rate of survival of fish during catch and replace angling. The aim of the literature review was to identify the main factors involved and to recommend best practice measures to help ensure the survival of released fish. The review considered:

- direct factors associated with the angling event such as angling methods
- the impact of external factors including environmental factors such as temperature

The main factors found to reduce survival are:

- fishing method, including tackle and baits
- deep hooking leading to tissue damage and bleeding
- physical damage from poor and excessive handling leading to scale loss abrasions and infection
- being kept out of the water for a prolonged period causing tissue and gill damage
- high water temperatures

Close links have been found between water temperature and survival in salmon, with elevated temperatures causing higher rates of mortality following release.

Survival rates for salmon are greatly increased if appropriate angling techniques and equipment are used, and best practices for catching, handling and releasing angled fish are adopted.

To give the fish the best chance of full recovery from capture and further contributing to the fishery or going on to spawn, the literature review identified the following series of best practice measures:

- Consider the most appropriate angling method and tackle to use where catch and release is mandatory, or where release is intended.
- Minimise angling duration to avoid fish becoming exhausted. This is particularly important at high water temperatures.
- Avoid angling at high water temperatures.
- Use single barbless hooks to minimise risk of injury.
- Use the least harmful bait/lure type (for example, artificial lures with minimal, appropriately sized, barbless hooks fished actively), even though it may not be the most effective for catching fish.
- Minimise air exposure, ideally not removing the fish from the water during landing, unhooking and photographing.
- Use fish-friendly landing nets with soft knotless mesh to help protect fish from abrasion injury.
- Handle fish gently with wet hands and do not squeeze as this can damage internal organs. Avoid touching the gills and eyes when handling.
- Always support the fish under the belly and keep in an upright / horizontal position, preferably underwater and facing into the current.

- Remove the hook with a long pair of forceps, disgorger or another unhooking device. When it is not be possible to remove the hook, cut the leader as close to the hook as possible as the hook will work its way out. This is less damaging than prolonged handling.

The findings of this review will be used by the Environment Agency and partner organisations, including the Angling Trust, to inform the development of best practice recommendations for salmon rod angler as part of measures to further reduce exploitation by nets and rods under the Salmon Five Point Approach.

This summary relates to information from project EcoSF2/16/93, reported in detail in the following output(s):

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