

**Newfoundland and Labrador
Atlantic Salmon Hook and Release Study - An Overview**

Overview

The primary goal of the Newfoundland and Labrador Atlantic Salmon Hook and Release Study was to undertake the most comprehensive examination of hook and release for this species, and determine conclusively what the mortality from hook and release is for salmon in this province. A secondary goal was to develop a set of recommendations for the practice and regulation of hook and release angling.

In addition to this overview, the full version of the study has been submitted for publication in a scientific journal. **A current draft of the full study is available [here](#).**

Why study hook and release of Atlantic salmon?

Hook and release is a long-standing practice used by anglers throughout the range of the Atlantic salmon, including Newfoundland and Labrador. The proportion of anglers who practice hook and release varies among jurisdictions, regions, and rivers. In Newfoundland and Labrador the majority of anglers practice a mixture of both retention and hook and release angling. However, in recent years as salmon populations have declined and retention angling has become increasingly restricted, hook and release angling has become more popular for many anglers. The restrictions on retention angling and the expansion of hook and release has led many anglers to seek more information on the practice of hook and release.

Hook and Release vs Catch and Release

Anglers often refer to hook and release as catch and release. However, the term catch and release does not capture the complete nature of this practice. The stress event and potential for injury for the salmon begins the moment the fish is hooked by the angler. Salmon that are hooked and escape before being landed are also at risk of injury and death. Using the term hook and release encompasses the entire event and covers all fish hooked.



During hook and release, salmon may be injured, exhausted beyond recovery, or weakened in a way that affects behaviour and ultimately long-term survival and spawning. There has been a great deal of discussion in the province over what the actual impact on Atlantic salmon populations is from hook and release. Estimates of mortality in scientific literature range from zero to 80 per cent. This large range of mortality estimates is mainly driven by differences in study designs and low samples sizes.

Each year, it is estimated that tens of thousands of salmon are hooked and released in this province, if mortality is substantially higher than the 10 per cent estimate presently used by Fisheries and Oceans Canada (DFO), this practice could pose a significant conservation risk to salmon. In this study, salmon survival after hook and release was measured while also tracking the many factors that affect survival, such as temperature and release technique.

What is not addressed in this study?

This study does not attempt to address any of the ethical questions around hook and release. Many anglers and other members of the public believe that allowing stress events on large numbers of salmon purely for sport purposes is fundamentally unethical and inhumane to these animals. Some retention oriented anglers believe angling should be limited to retention of a small number of salmon for sport and consumption. i.e. catch and retain two salmon (the current season limit) and then cease angling. There are also many anglers who view hook and release, especially when practiced properly, as a humane method to maintain the social and economic benefits of angling while conserving salmon populations. This is a philosophical debate not a scientific one.

How was the study undertaken?

Western Arm Brook on the Northern Peninsula was chosen as the experimental river. This river is closed to angling for research purposes for a number of decades and has a DFO counting facility. This allowed provincial scientists with the Department of Fisheries, Forestry and Agriculture's Wildlife Division to have complete control over the hook and release angling that occurred on the river, and access to salmon from the counting fence to create a control group (fish who were tagged and tracked, but not hooked and released) for the experiment.



From 2018 to 2021, 283 salmon were tagged with radio tags and tracked to determine their fate after angling or release from the counting fence. For each individual salmon hooked and released, angling event data was collected on many possible factors affecting survival.

The hook and release was carried out by anglers with a varying range of experience and age that included beginners to those with 40+ years. Anglers were directed to hook and release the salmon as they typically had in the past. No special care was taken, or instructions given, on how to handle the salmon. The angling occurred each summer from early July when the salmon entered the river until early in the fall, and covered water temperatures of 5 to 23°C (average 15.8°C). After release, the fish were tracked using seven radio telemetry stations along the course of the river, and regular telemetry flights. Individual fish were tracked from one to 300+ days, providing good estimates of short and long-term survival.

Results

When biologists compared the survival of salmon that were angled and those released at the counting fence, those that were angled had only slightly lower survival rates. **When compared to the control salmon, the angled salmon were three to six per cent more likely to die.** The risk of death after hook and release increased substantially as water temperatures increased, especially temperatures above 18 degrees Celsius. A summary of the conditions of the hook and release events can be found in Figures 1 and 2.

Data Collected

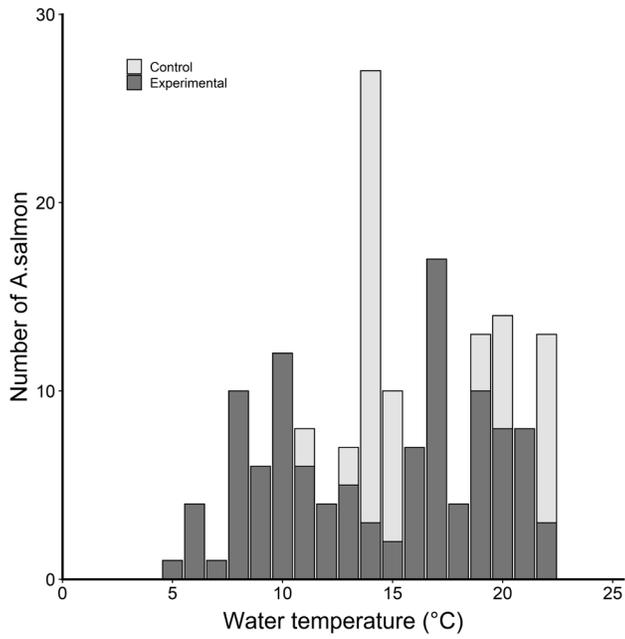
Scientists collected the following angling event data:

Angler Location	Hook Time	Surgery Time
Date	Land Time	Release Time (from landing to release)
Fly Pattern	Fish Condition at Release	Air and Water Temp
Hook Location on the salmon	Fork Length	Water Depth
	Time in Anesthetic	DNA and Scale samples were taken

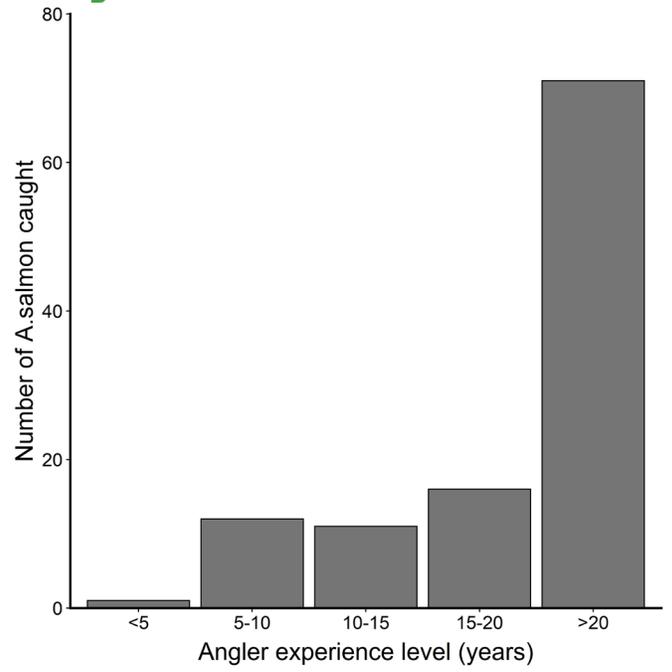


Figure 1

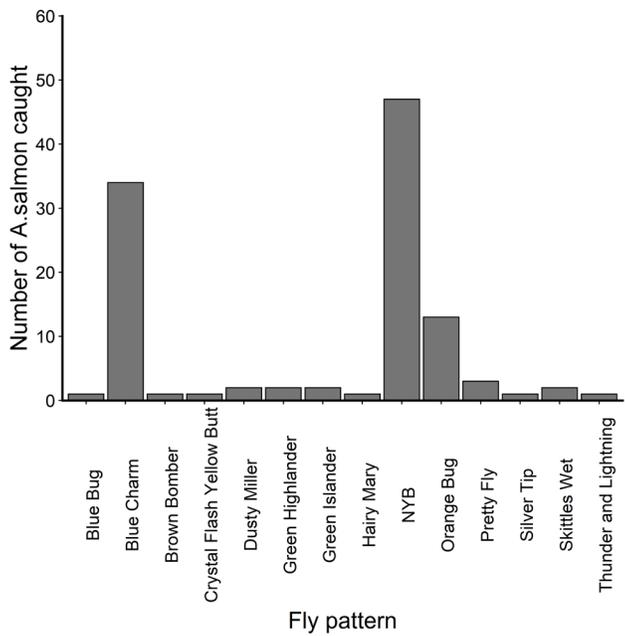
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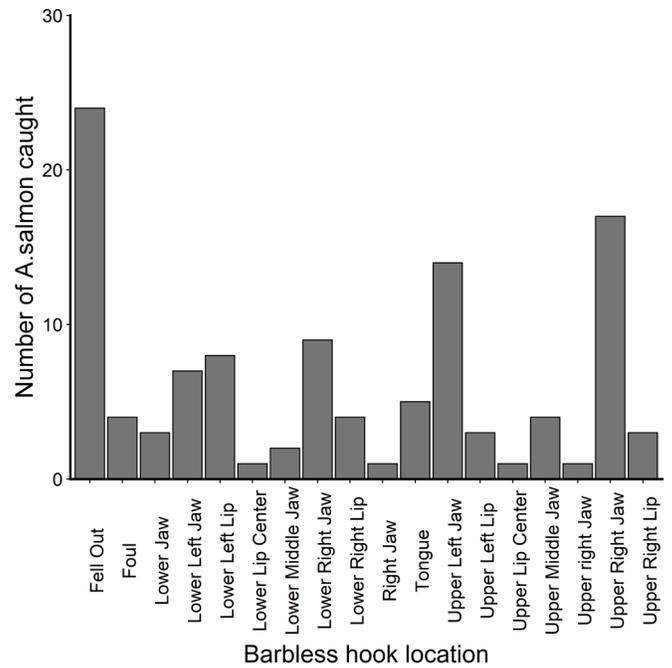
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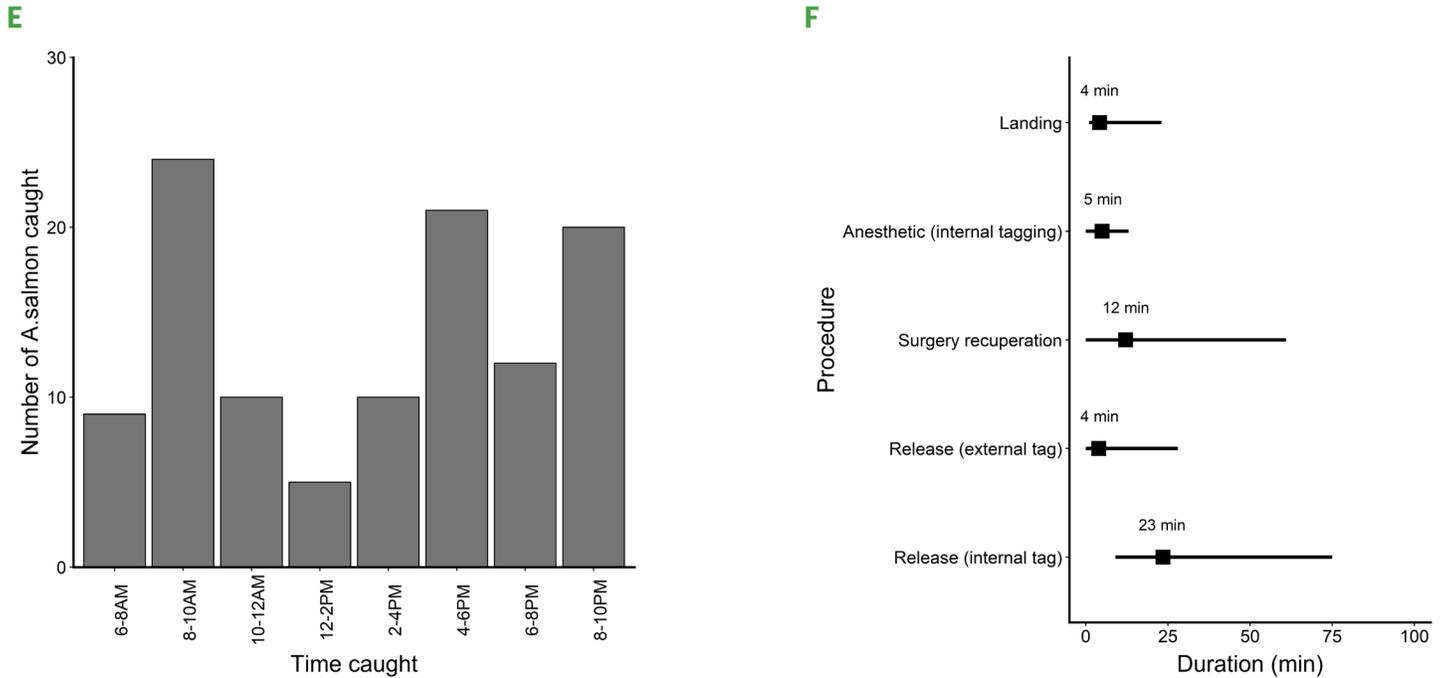
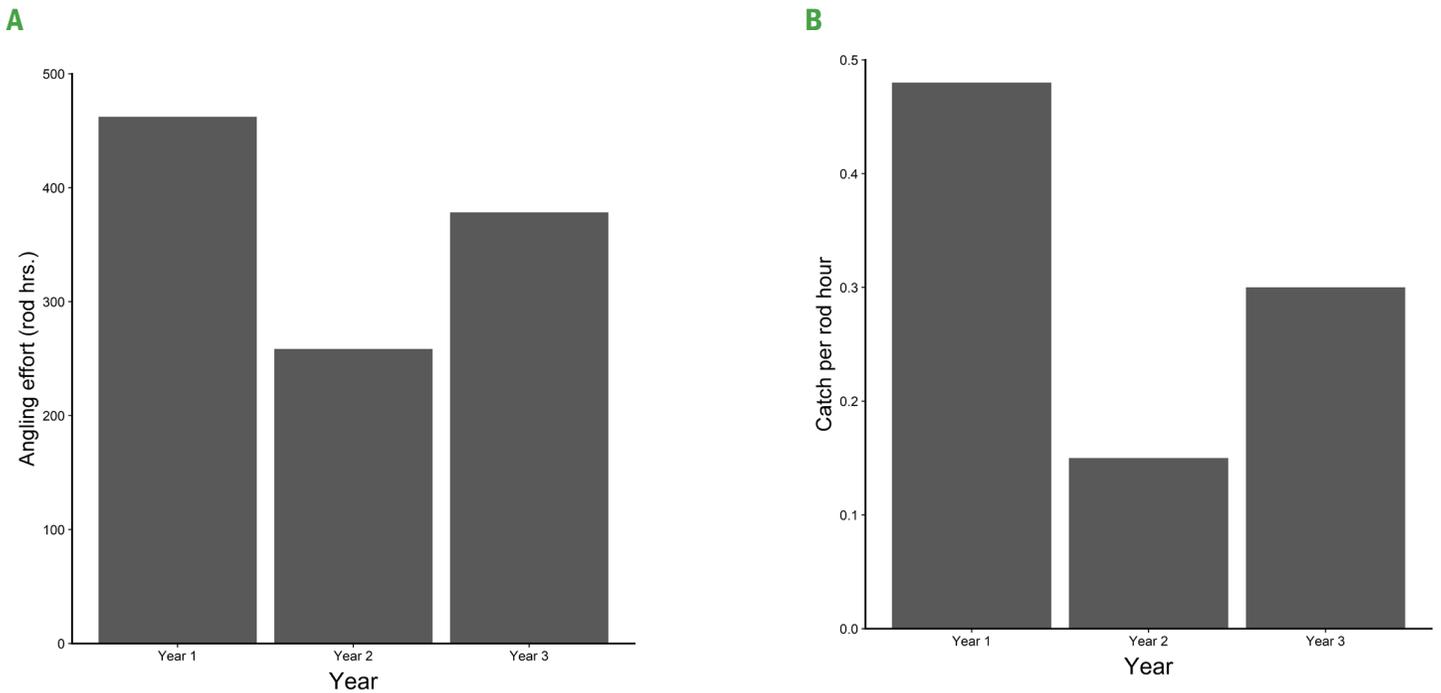


Figure 1. The number of Atlantic salmon that were either trapped at a salmon counting fence facility, radio tagged and released (control; light grey) or were angled, radio-tagged and released (experimental; dark grey) in relation to (A) water temperature, (B) angler experience, (C) time, (D) hooking location, (E) fly pattern at Western Arm Brook, Newfoundland and Labrador, Canada. Figure (F) is the minimum, mean and maximum durations of the various procedures used in the study. Release refers to the total time from hooking to release.

Figure 2



Recommendations

There were a number of factors identified that can influence the risk of death for a hooked and released salmon, however there are a few key best practices that were identified:

- Do not practice intentional hook and release in water temperatures over 18 degrees Celsius;
- Do not remove the salmon from the water;
- Do not touch or handle the salmon unless absolutely necessary (use bare wet hands).

Other best practices and decision-making points in the hook and release process are also important, but the three recommendations listed above are the most important to consistent successful releases.

Future Research

This first scientific paper was based on data collected during the Newfoundland and Labrador Atlantic Salmon Hook and Release Study, and focused on determining the effect of hook and release on survival of salmon. However, hook and release angling has also been shown to effect behavior (e.g. migration timing) and spawning. Future research planned by the provincial Wildlife Division and DFO scientists will be analyzing the data to determine if hook and release had effects on the movement and spawning of salmon in Western Arm Brook.

Hook and Release Best Practices

The following are some best practices for anglers related to hook and release:

1. Be sure you are aware of river conditions and regulatory status. Do not practice intentional hook and release at water temperatures over 18°C.
2. Be prepared to do a release. Have a plan and use the proper equipment including:
 - a. A knotless rubber net or sling
 - b. Pliers for removal of the hook
 - c. Fishing gear suitable to quick play and land salmon



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3. Play the salmon as quickly as possible, but ensure the salmon is at least partially fatigued. Handling a high-energy salmon that has been dipped too early is very likely to lead to a physical injury of the salmon.
4. While dipping or releasing the salmon, avoid removing the salmon from the water; and avoid touching the salmon with your hands, including holding the fish in your hands for photos. If the salmon must be handled, use wet bare hands. Gloves should not be worn when handling salmon.
5. If the salmon has an obvious injury and appears to be fatigued beyond recovery it should be retained if a tag is available.
6. If required, allow the salmon to recover in the rubber knotless dip net or sling, while keeping it in the water.
7. Release the salmon as soon as possible once the salmon appears recovered. For Grilse (salmon <63 cm), the ideal time from hooking a salmon until it is release should be about four to six minutes.



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