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**Catch and Release Survival Rates Overview**

Catch and release is now an integral component of fisheries management in many countries. As a result there have been numerous studies, both in the field and laboratory, to assess the biological response of Atlantic salmon (*Salmo salar*) to catch and release. An overview of the studies shows that, in the vast majority of cases, salmon do survive following catch and release (Table 1).

Table 1: Summary of available Atlantic salmon catch and release survival studies

<b>Number of Salmon in Study (N)</b>	<b>Duration- (days)</b>	<b>Survival (%)</b>	<b>Country</b>	<b>Reference</b>
300	10-14	95-99.7	North America	Warner, 1976
149	5	87	North America	Warner, 1978
177	2-5	65-96*	North America	Warner and Johnson, 1978
1221	3-14	94-95	North America	Warner, 1979
421	-	100	Iceland	Grant, 1980
20	-	100	Canada	Booth <i>et al.</i> , 1994
25	Until Spawning	84	Scotland	Webb, 1998
62	1	98.4	Russia	Whoriskey <i>et al.</i> , 2000
49	40	91.8	Canada	Dempson <i>et al.</i> , 2002
30	-	97	Norway	Thorstad <i>et al.</i> , 2002
36	Until Spawning	97	Ireland	Ireland Central Fisheries Board, 2006
18	Until Spawning	100	Norway	Thorstad <i>et al.</i> , 2007

\*fish caught with worms in juvenile nursery areas.

The data from these studies, spanning over 30 years, shows survival rates of Atlantic salmon, when following the correct code of practise and in favourable environmental conditions, are very high, and can be 100%. Whoriskey *et al* (2000) held 62 angled fish, in Russia, for 24 hours to evaluate mortality rates. Only one of the 62 died during the experience, which was noted as being heavily scarred with gillnet marks. The 24 hours timeframe is believed to be when most fish fatally stressed as a result of angling will die (Booth *et al.*, 1995). Grant (1980) conducted catch and release studies in the Grimsa River, Iceland, on 421 sea-run Atlantic salmon between 1977 and 1979. He observed no mortality, including 15% of the salmon which were angled for a second time during the experiment. In Sautso, Norway, 97% of radio tagged salmon survived hook and release, and the number of spawning redds more than doubled after the introduction of compulsory release of all angled salmon in the region in 1998 (Thorstad *et al.*, 2002). The study concluded that hook and release fishing can be an effective management tool to enhance declining Atlantic salmon populations.

Mäkinen *et al.*, (2000) investigated the effects of gill-net entanglement and catch and release on the behaviour of 23 grilse and one 2 sea-winter radio-tagged Atlantic salmon in the River Ohcejohka, Finland. They found gill-net caught fish exhibited more extensive downstream running, than rod-caught salmon. This suggests gill-netting impedes upward migration more than catch and release practises.

Effective catch and release, however, can be jeopardised by extended play time, hooking location, the use of live bait and air exposure (Casselman, 2005). Studies have also shown several environmental factors, such as water temperatures above 22°C and very soft water, can reduce the survival rate in angled salmon by having a profound effect on their recovery. Angled salmon which have recently entered freshwater are also more vulnerable to the stress, due the significant osmoregulatory pressure (Tufts *et al.*, 1997).

When performed correctly, catch and release can be very successful, resulting in minimal harm to the fish, and successfully spawning. This is not really surprising as salmon are highly adapted to cope with periods of exhaustive exercise and stress, during their gruelling spawning migrations. Research has shown spawning success and the viability of eggs are unaffected in salmon caught and released in late autumn (ref).

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## Notes:

### **Voluntary Catch and Release Guidelines (from Central Fisheries Board, Ireland, and NASCO).**

- *Use barbless hooks, which do less damage, are easier to remove and reduce handling time.*
- *Avoid exhausting the fish*
- *In a river, move the salmon out of the fast current into quieter water*

- *Once the fish is subdued bring it quickly to the bank or boat*
- *Keep the salmon in the water at all times, research shows air exposure significantly reduces a salmon's chances of survival.*
- *Use a large diameter landing net with soft knotless mesh- no gaffs or tailers*
- *Handling should be minimal and always with wet hands, to reduce injury and fungal infection.*
- *Avoid weighing the fish (the weight can be estimated from its length using the conversion chart)*
- *Hook should be removed gently, either by hand or using long-nosed forceps. If a hook is deeply embedded and cannot be removed, the leader should be cut close to the hook.*
- *To release the fish, supported in the water facing into the current, giving sufficient time to recover*
- *Unless compelled by statutory regulations or local rules, fish that have suffered serious damage (bleeding heavily, hooked in the gills or eyes) should be retained*