

# The Reasons and Solutions for the Decline of Atlantic Salmon in North America

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## ABSTRACT

Atlantic Salmon, or *Salmo salar*, is a fish species native to the waters of North America. These salmon are typically twenty eight to thirty inches long and weigh eight to twelve pounds. When living in freshwater the salmon have blue and red spots, but as they mature they take on a silver-blue sheen. In the adult phase, the easiest way to identify them is by the black spots above the lateral line.

Atlantic Salmon populations are a growing concern in the world. This once prosperous fish species has declined significantly since the early 1900's. Their rapid decline is due to numerous factors. These causes for decline need to be solved before their population is completely wiped out.

## INTRODUCTION

The salmon follow an anadromous migration pattern, meaning most of their life is spent in salt water. The stages of the salmon are egg, alevin, fry, parr, smolt, and kelt. The diet also changes as the salmon grow. Salmon start out feeding on yolk sac and then moves on to tiny invertebrates, caddis flies, blackflies, arctic shrimp, sand eels, and amphipods. They also have a wide distribution of habitat; from the rivers of Western Europe to northern Portugal to Norway, Iceland, and Greenland. In North America, Atlantic salmon can be found from Connecticut to Northern Labrador and Arctic Canada.

The Atlantic Salmon population needs to be conserved because of their importance to humans. They play an important economic and environmental role in the world.

The decline of the salmon is a result of several different factors. Overfishing, predators, pollution, hydropower, and habitat destruction are the main causes for the decline of salmon. I used this knowledge to educate a local middle school on the lifecycle, development, and reasons for decline of salmon.

## MATERIALS AND METHODS

For this project I worked with seventh graders at Salem Middle School. I taught several lessons, including how salmon develop, the specific phases of their lifecycle, and the reasons for their decline. Students are also raising the salmon eggs in a tank in their science classroom. An example of one of the activities they did involved the developmental chart below. It helped the students to understand the developmental changes that salmon undergo and track how fast they are growing.

At 1% eggs are fertilized  
At 29% eggs are weakly eyed  
At 47% eggs are strongly eyed  
At 58% eggs are 90% hatched  
At 97 – 100% the yolk sac of the salmon fry has been absorbed and it is time to release (or stock) the fry



Students examining the salmon eggs in aquarium kept at 5 C with help from a chilling unit



Students getting assistance calculating development of their salmon eggs using tank temperature and the developmental index.

## RESULTS

I was able to educate the public about the importance of Atlantic salmon and help increase awareness about the endangered status of Atlantic salmon. The students will release the salmon in the Eight Mile River in May and gain firsthand experience about the salmon's importance in a local ecosystem.



Student group talking about how salmon travel back from the sea to rivers to spawn.



Student activity exploring the use of chemical cues by salmon during migration.

## CONCLUSIONS

Atlantic Salmon have been decreasing for over a century. Many of the reasons for decline of this population have their origin in human actions such as building dams, polluting water, and overfishing. If steps are taken to mediate and/or reverse this damage, then the population could possibly increase. Not only will the repopulation of Atlantic Salmon be beneficial to their species but to humans as well. This species is part of a larger ecosystem and a healthy population of salmon indicates a healthy ecosystem. It was fulfilling to help students gain a more in-depth understanding of conserving wildlife and gave me a sense of accomplishment.

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