

Atlantic Salmon Threats

Salmon have to cope with threats in both freshwater and sea water environments in order to survive. Many threats are completely natural - like flash floods or predatory birds, larger fish and otters or seals. These threats have always existed but it is man-made threats that are causing the real concern.

Pollution of Rivers and Silting of Spawning Gravels

To be healthy, Atlantic salmon need cool, clean water which contains a lot of oxygen. Chemicals, oil and rubbish can all pollute a river. If hot water is released into a stream the water temperature may become too warm for the salmon and they will die. Acid rain can lead to acid pollution known as acidification.

Problems with spawning can be caused by cattle walking in the river and stirring up mud, which can stick spawning gravels together and make it difficult for the salmon to make redds. If the river banks become eroded then too much mud will be washed into the river. Overgrazing and deforestation can also lead to excess mud being washed into streams and rivers leading to clogging. Afforestation can be a problem where conifers are planted alongside rivers. The needles are acidic and can increase the acidity of the water? Conifers also block out too much light and prevent beneficial vegetation from growing alongside the rivers.

Organic pollution in the form of silage and slurry 'run off' from farm land can cause problems in rivers. This increase in nutrients causes too many plants to grow in the water. Their subsequent decay leads to an increase in bacteria in the water which uses up oxygen so there is a fall in the amount of oxygen available for the salmon.

Access Problems

Dams and other water schemes may prevent the salmon swimming to some parts of the river. The obstacles can lead to a fall in the number of spawning areas. Fish ladders (special water filled staircases that salmon swim up) can be made next to dams to allow fish to bypass obstacles.

Alien Species

Sometimes biologists call plants and animals aliens when they are found living somewhere where they wouldn't occur naturally. One alien species that causes a problem for salmon is the American signal crayfish. This creature has been introduced to some rivers in Scotland,

although it normally lives in North America. The crayfish has sharp claws (which can give you a nasty pinch!) and is a predator eating insects, fish eggs, fry and larger fish. The crayfish is not a normal part of the food chain in Scottish rivers and by eating these foods it changes the way that energy moves through rivers. It also creates burrows in riverbanks which make the banks weak and more likely to collapse.

By-Catch

In the sea, there are fisheries for lots of different kinds of fish. Sometimes, when a fishing boat is trying to catch one kind of fish, it will catch other kinds of fish by mistake. The fish caught by mistake are called by-catch. Salmon smolts can sometimes be caught by accident by fishing boats looking for other types of fish, such as mackerel. Often by the time a fishing boat realises it has caught the wrong type of fish, the fish is already dead. As salmon smolts move as a group in the sea, a fishing boat can sometimes catch (and kill) a lot of smolts all at once. Over fishing of fish that the salmon feed on leads to depleted stocks of food for the salmon.

High Seas Fisheries/ Coastal Nets

There are specific fisheries in the sea that target adult salmon returning from their feeding areas. These fisheries take place in parts of the sea that do not belong to any one country and are called high seas fisheries. Adult salmon coming back to Scotland will tend to use the same general migration route across the sea before choosing to go down either the west or east coast to return to their home river. It is when they are crossing the sea in a big group that they are vulnerable to high seas fisheries. Once they have chosen to follow the coast back to their home river, they could be caught in coastal nets.

Disease

Fish can catch diseases from each other in the same way that humans catch diseases from other humans. Some diseases have had a terrible effect on salmon. One disease that affected salmon skin was caught by almost all of the salmon in Scotland in the late 1970's. The effects of this disease on salmon numbers can be seen in the catch statistics for this period, where less fish were caught because so many fish died. This shows what a threat diseases are to salmon. Parasites can also affect salmon. The Scottish Executive is trying to guard Scottish salmon from a parasite which has resulted in wiping salmon in over 20 Norwegian rivers. The parasite, called *Gyrodactylus salaris*, infects the gills, fins and skin of a variety of freshwater fish and holds on to the salmon with tiny hooks. It could possibly be

brought into Scotland by mistake if fishermen do not disinfect their fishing equipment properly.

Climate Change

Climate change is thought to have already had some effects upon Atlantic salmon and may be partly to blame for their decreasing numbers. There is evidence that the temperature of the sea's surface may affect smolt survival. It is also thought that climate change may affect salmon growth rates or make their food less available. Predator numbers may also be affected by temperature. Scientists do not know exactly what might happen if climate change continues and they are undertaking research to try and predict what might happen to Atlantic salmon under a variety of different climate conditions.

Fish Farming

Farmed salmon production in the North Atlantic area has increased dramatically, particularly in Norway, but also on the west coasts of Ireland and the Scottish Highlands.

A number of problems have resulted, which include:

- High concentrations of sea lice, which multiply in the confined conditions of sea rearing cages. As explained earlier, migrating sea trout and salmon smolts can be very vulnerable to attack by these lice. In some rivers, wild stocks have virtually collapsed.
- Escapes of farmed fish, which are known to be able to interbreed with wild fish. Since stocks in individual rivers are locally adapted to optimise their survival, this interbreeding has been shown to reduce the fitness of wild stocks for their local environment.
- Pollution of the water environment, by uneaten food, fish faeces, or medications used to treat farmed salmon in their cages.
- The risk of the spread of disease or parasitic infestation, such as Infectious Salmon Anaemia and Gyrodactylus Salaris.