

Many hydro power projects that block the rivers use the massive production and stocking of artificially produced salmon as a compensatory measure as well as an alternative for habitat restoration. Instead, they should invest more in fish passages and fish guidance systems around their obstructions and in habitat restoration.

Suspected causes for the decline:

- post-smolts are killed as a by-catch in fisheries for other species (cod, herring, whitefish etc);
- lower reproduction rates as a result of the M74 syndrome;
- salmon are killed in the industrial fisheries for the production of fish food;
- increase in coastal fisheries with small boats and gill nets;
- lower survival of salmon because of exposure to harmful substances in their fresh water phase;
- lower survival of artificially reproduced salmon, stemming from sea-ranching programmes;
- climate change that results in changes in the Baltic and the food chain that lead to lower survival of the salmon;
- increased numbers of known predators of the salmon (seals, cormorants etc.).

## What the EAA wants

The EAA (European Anglers Alliance) urges the Commission and Member States, to take a precautionary approach to the future management of the Baltic salmon by adopting the following principles:

1. All Baltic salmon (whether smolts or adults) should be allowed to migrate freely within river systems, from the estuary to the source and vice versa. Consequently, all hydro power stations should be provided with effective fish passages (for upstream migration) and fish guidance systems (preventing mortality during downstream migration);
2. All wild salmon should be allowed to return to their natal rivers. Salmon in rivers create jobs and have a high positive economic impact on all river interests. More salmon are a prerequisite for seizing more of the huge growth potential -sustainable growth- to the benefit of local communities and to secure engagement in much needed river restoration projects as well as the best argument to protect rivers from new hydro powerstations;
3. The commercial fishing in the Baltic Sea on mixed salmon stocks (wild and reared) should be prohibited. The wild salmon should be preserved not only for conservation reasons, but with the added socio-economic benefit also for recreational and tourism angling in rivers.
4. The Commission should take into account the very large difference in socio-economic output versus the biological impact from various kinds of salmon fisheries. Commercial fisheries still capture around 97% of the total catches of salmon around the Baltic Sea. The value of salmon in recreational angling fisheries amounts to several hundred Euros/kg, whereas the corresponding figure for commercial fishing is very much lower. More detailed statistical material is needed in order to describe the total catches in relation to the economic turnover from commercial as well as from recreational fisheries to improve the management of the salmon in the Baltic Sea.
5. Better catch data on commercial and recreational fishing is needed, and should make a clear distinction between salmon caught in the Baltic, estuaries and inland waters (rivers);
6. The BS RAC recommendation of 1st March 2007 on a salmon management plan for the Baltic Sea is in conflict with the best use of the salmon resource for its socio-economic impact, and also with common sense. The BS RAC has proposed that wild Salmon production in the most important salmon rivers such as the River Torneå and Kalix should gradually be increased to attain by the year 2020 a level of 75 % of their estimated potential. At the same time, research from ICES reports indicates that these rivers have already (during the year 2005) produced more than 75 % of their potential production. In fact the BS RAC's proposal, for most of the affected rivers, if implemented, could cause a reduction in the salmon production during the period 2010 to 2020;
7. EAA urges the Commission to take into account the various management guidelines agreed by NASCO for Atlantic salmon. The EU is a signatory to the NASCO convention. NASCO guidelines on the precautionary approach to salmon management, including mixed stocked fisheries and socio-economic guidelines, represent a vast pool of knowledge, which should be taken into account during the revision of the Baltic Salmon Action Plan.
8. EAA urges the Commission not to follow the RAC advices of 2007 and 2008, but to take fully into consideration the information provided in this paper. It may also be that the RAC advice is in violation of the habitats directive.
9. EAA likes to have an exchange of information and a discussion with the Commission and members of the EU Parliament on how to best manage the Baltic Salmon.



All salmon should be allowed to migrate freely within river systems.



The value of wild salmon in recreational angling fisheries is high.



Catch data is needed for a good fisheries management.



# Baltic salmon

## Problems, threats and solutions

## Baltic salmon

The Atlantic salmon has for ages been the icon for migrating fish as well a symbol of vitality. His name means 'the jumper' in Latin, referring to the legendary capacity to jump over water falls that are insurmountable for most other fish species.

During and after the last ice age a unique type of salmon evolved from the Atlantic salmon when the Baltic lost its connection with the North Sea and the Atlantic Ocean..

They lost their urge to swim into the Atlantic and kept this trait even when, after the last ice age, the Baltic was connected with the North Sea again. One thing is very sure: Baltic salmon are genetically not very closely related to the other European Atlantic salmon.

Since about 60 years the populations of Baltic salmon have been declining in nearly all of its original range. The causes of the decline are manifold and sometimes even unknown. With this position paper the European Anglers Alliance wants to get your attention for the problems confronting the Baltic salmon and to contribute possible solutions to address these problems.

## Life cycle

In late Autumn or winter, Baltic salmon spawn on the gravel beds of rivers and streams that flow into the Baltic. February to May the young salmon hatches and after another month or two leaves the safety of the gravel and embarks on a hazardous journey out into the open stream. After one to four years the young salmon (length about 15 cm) makes its way out to the Baltic sea as a "smolt". There it will stay for at least one, but often two to three years, feeding on smaller fish or crustaceans and growing at a very fast rate. Salmon that already return in the summer of the year following their journey into the Baltic are called "grilse". So after one to three years in the Baltic, the adult salmon begins a return journey which will bring it to the stream in which it was born. It spawns and thus begins the life cycle of the next generation of salmon.

## Migration barriers

The current decline of the Baltic salmon is caused by many factors. One of the most important factors that negatively influences the survival of this species, is the existence of man-made migration barriers.

Despite its reputation as a great leaper, there are man-made barriers that are insurmountable for even the Baltic salmon. Barriers can also prevent young downstream migrating salmon (smolts) from reaching the estuary and the Baltic sea.

Migration barriers and hydro power stations also make salmon – both young and adults - more vulnerable for predation by fish, birds or mammals.

Hydro power stations (and the dams or weirs that come with it) not only constitute serious barriers for upstream and downstream fish migration, but also kill downstream migrating fish, like young salmon, in their turbines right away. Man-made migration barriers come in many guises:

- Weirs, dams and sluices for shipping, water management and flood control;
- Weirs and dams for hydropower and irrigation;
- Large bodies of stagnant water created by the impoundments;
- Hydro power stations with turbines to generate electric power.

Problems caused by man-made barriers:

- Salmon cannot reach their natural spawning places upstream anymore;
- young (downstream migrating) salmon cannot reach the Baltic anymore;
- young (downstream migrating) salmon are killed in hydro power stations;
- drastic changes in the environment, a.o. loss of habitat for spawning and growing up;
- salmon are very vulnerable for predation in the impoundments.

With the help of fish passages or similar systems salmon can navigate most of these barriers.

Solutions:

- fish passages (Fish ladders) and fish lifts;
- fish guidance systems at hydro power stations (downstream migration);
- restoring minimum-water flows through original parts of rivers besides hydro power stations (acting as bypasses and habitat for spawning and growing up);
- a more fish friendly sluice management.

## Fisheries

Wild Baltic salmon are valued as a game fish and as a fish for the table. The catch by commercial and sport fishers has an impact on salmon populations. Fishing for salmon is done at many places and executed in many different ways. In most cases sport fishing for Baltic salmon is more easily managed and has a far smaller impact than commercial fishing and it poses no threat for the species. Where the salmon occurs in the Baltic Sea and along the coast, the stocks are of mixed origin. It is only in the rivers that the fishing can be regulated in accordance with the status of each salmon stock.

## Fishing in rivers

Commercial fishing in rivers – especially for fresh-run salmon in the lower parts – used to be economically important, but it has in most countries given way to the much more profitable sport fishing for salmon. The economic value of a salmon caught by sportfishing can be up to 30 times the market value of a commercially caught salmon (counting investments in tackle, travelling, lodging, food, licences and guiding). To promote sport fishing for salmon as well as protect the spawning population of salmon it is important to ban all commercial fishing for salmon in rivers.

## Fishing in estuaries

Commercial fishing is mostly done with trap nets, gillnets, seine nets or long lines. Commercial fishing in estuaries has a negative impact on the salmon runs in rivers. Especially salmon stocks in small rivers are very sensitive to these fisheries because the migrating Salmon often delays in the estuaries waiting for higher water-levels before entering the river. In some cases commercial fishing in estuaries and deltas has been bought out in order to restore dwindling salmon runs. If the fishing for other fish species (e.g. whitefish (*Coregonus lavaretus*) in these waters continues, the danger of by catches of salmon (both juveniles and adults) remains. Sport fishing for salmon in deltas and estuaries is in most river systems almost non-existent and it only poses a



problem in those places where migration barriers exist. A ban on commercial fishing for salmon in deltas and estuaries is an important tool to protect the wild salmon population of a river.

## Fishing in coastal waters

Commercial fishing for salmon in coastal waters is mostly done by trap nets and gill nets. The commercial fishing for salmon in coastal waters can have an impact on the salmon populations in the rivers entering the coastal waters of a given region. Limiting those commercial fisheries in time (e.g. early summer ban) is a good alternative, if a total ban is (politically) not feasible.

Commercial fishing in coastal waters may also cause problems, by not only intercepting the salmon of nearby rivers, but also by catching the passing salmon that are bound for rivers much farther away. Because many fish species are overfished and also because fuel prices are rising, commercial fishermen are turning to other species and other methods. As a consequence, the fishing in coastal waters with small boats and gillnets on species like whitefish, perch and pike-perch is on the rise. Even if the salmon are legally protected, it is almost impossible to prevent the by-catch of salmon in these intensifying fisheries. In many countries governments do not regulate these new developments.

## Fishing in the Baltic

In the Baltic salmon from many rivers congregate at certain feeding grounds. Fisheries in those areas catch Baltic salmon that originate from many different rivers.

The majority of wild salmon in the Baltic is of Swedish origin and consists of salmon from Swedish rivers, mixed with wild salmon from other nations (e.g. Finland) and a high proportion of stocked salmon from hatcheries. Because of this fact these mixed-stock fisheries pose a threat to the wild salmon populations, in particular those with the status 'threatened'.

The commercial fishing for salmon on their feeding grounds in the Atlantic Ocean and the Baltic Sea is nowadays severely limited. Unfortunately this had little visible effect on the declining survival of the Atlantic salmon (At least it could not prevent a further decline).

The driftnet fishing for Baltic Salmon in the Baltic has now stopped, but some countries in that area apply pressure on the EU to allow other fisheries to increase their damaging activities.

## Polution and diseases

Pollution is nowadays recognized as one of the main threats for wild salmon. In many river systems the treatment of industrial and sewage waste water is mandatory and well enforced. Consequently, the large scale water pollution seems a thing of the past in most countries. In some parts of Sweden acid rain is still a severe problem.

Water with high acidity may kill all young salmon or reduce their survival. Many rivers and lakes are treated with lime to reverse the situation and these projects have to be continued for many years to come.

The main chemical pollution that remains, now stems from diffuse sources like residues from insecticides and herbicides. For instance, the insecticides in the so-called 'sheep dips' can be very harmful for wild salmon, reducing their survival and their ability to orientate themselves during their migration.

Possible solutions for problems caused by insecticides, herbicides and acid rain:

- more support for studies of the effects of herbicides and insecticides on water ecosystems and water fauna in general and salmon in particular;
- herbicides and insecticides with proven harmful effects on fish and other water fauna should be banned and environmentally friendly alternatives should be developed and used;
- Prevent acid rain by for example modernizing the industry and electric power plants (powered by brown coal) mainly situated in Eastern and Central Europe.

Besides pollution and the effects of acid rain there is nowadays a continued mortality of salmon in freshwater caused by a disease, or rather disorder, called the M74 syndrome. M74 syndrome is a reproduction disorder among Baltic salmon. It leads to a substantial mortality in yolk-sac fry. Before dying, the yolk-sac fry display typical symptoms. Parent fish sometimes already show a loss of equilibrium, a forewarning of more to come in their offspring. The causes of M74 are still largely unknown, but its occurrence is probably connected with low thiamine (vitamin B1) content of eggs and therefore may have something to do with certain prey species in the Baltic and environmental problems.

More research is needed to find the causes of the M74 syndrome and to address the problem.

## Lower survival in the Baltic

The survival of Baltic salmon post-smolts has declined by almost 30% since 1970. It is suspected that there are many man-made causes for this decline.

The climate in the Baltic area is also gradually changing. Average yearly water and air temperatures are increasing and these can have considerable effects on sea currents, weather and all life forms in the Baltic.

Warmer temperatures in the Baltic and other changes may lead to lower food availability and behavioural changes in salmon, ultimately leading to lower survival of salmon in the Baltic.

Another negative effect is caused by the massive stocking of artificially reproduced and bred young salmon (parrs and smolts). These farmed fish show a much lower survival in the rivers and the Baltic than their wild relatives and cause a more intensive fishery in which many salmon of wild origin are being caught.

1. A natural barrier in one of the Norbotten's rivers. A barrier like this may slow a salmon down, but will not stop it from swimming upstream. 2. Traditional fishing method in the Tornionjoki River. 3. A rod caught salmon in the Salaca River. 4. A nice catch in the Gauja River. Wild Baltic salmon are highly valued as game fish. 5. The Isohaara dam in the River Kemijoki is one of the man-made barriers that negatively influences the survival of the salmon. 6. Commercially caught Baltic salmon.