

## Salmon Back in the Elbe River

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Once the Elbe and its tributaries were teeming with fish. Among them, salmon used to be a popular as well as regular catch. Due to the construction of dams and decreasing water quality, the salmon population diminished rapidly from the mid 19th century onward. The last catch of salmon was registered in 1947.

The Elbe takes its origin in the Giant Mountains in the Czech Republic and flows through eastern and northern Germany before it empties into the North Sea. With two thirds of its entire length of 1165 km located in Germany, the Elbe is the country's second largest river.

The fall of the iron curtain and reunification of Germany have made possible cooperation in environmental issues on a new scale. In a concerted effort, all riparian German Länder (federal states) on the Elbe have formed a working group for the management of fishing. One of their projects is the reintroduction of the Atlantic salmon (*Salmo salar*) into the river and its tributaries. Recently, the Czech Republic also joined the initiative.

In April 1995 the first fry of Atlantic salmon collected from the Shannon and Delphi river in Ireland was released into a tributary in the Free State of Saxony, a federal state on the territory of the former German Democratic Republic. This procedure has since been repeated on an annual basis. A year later the first smolts migrated into the Elbe. In October 1998 the first spawn was found in the initial tributary. By the end of November 1998 scientists had counted 27 fish that had made their way back to the site of release, fourteen of which were identified as spawners.

The return of spawning salmon has been a landmark in the realization of the project. Nonetheless, there is still a long way to go before the Atlantic salmon is reestablished as an integral part of the river system, and

even longer until fishing for commercial uses might be possible again. A stable rate of reproduction without the continuing addition of external fry is one of the prerequisites. Furthermore, the reasons which have led to the extinction of the Atlantic salmon in the area in the first place have to be addressed, i.e. construction which obstructs the water course, and pollution.

Only if dams allow for a proper pass-through for migrating fish do these creatures have a fair chance to survive. The Geesthacht Dam near Hamburg has recently been furnished with a new fish ladder which facilitates the passage along a major obstacle close to the estuary of the Elbe. A number of additional fish ladders are being planned.

Water quality in the Elbe was low in 1947 and has deteriorated further during the forty years since. The chemical and pulp and paper industries as well as intensive agriculture of the former German Democratic Republic were prominent sources of surface water pollution. Since the political changes in 1989, legislation has been adopted that introduces state-of-the-art technology and new threshold values for pollutants. Factories have been closed down and sewage purification plants have been built. While such measures have led to significant improvements in water quality, the concentration of pollutants in the Elbe still ranges way above those of other fluvial systems in Germany, e.g. the Rhine River along which the most important players of the German chemical industry are located. On the other hand, in the territory of the former German Democratic Republic, the Elbe has not been forced into an artificial river bed to improve navigability to the same extent to which this has been the case along the lower part of the stream. Thus, in the upper reaches of the Elbe, one may still find riparian zones that are good habitat for flora and fauna.

The Atlantic salmon has been identified as an indicator species for discharge, water quality, and the integrity of stream systems because of its high sensitivity to these requirements. The future development of the

species in the Elbe will reflect the overall state of this ecosystem.

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