



The Moselle Eel Protection Initiative



An Initiative by the German Federal State of Rhineland Palatinate and RWE Power



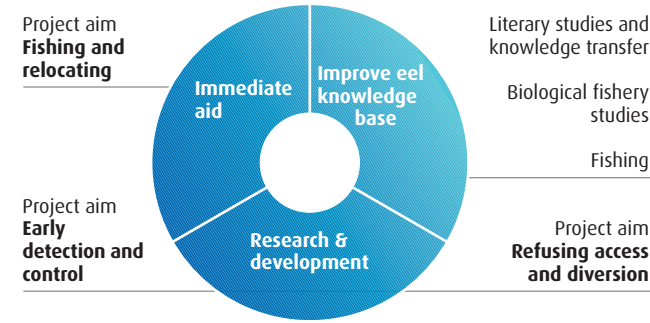
Model tests conducted by RWTH Aachen

As part of the various research works, scientists are trying to develop a model which can reliably predict the migration times of the eels. By mounting an investigation platform in front of the intake of the Trier power station, scientists assessed whether it was possible to track the migrating eels with the aid of fish trapping and hydro-acoustic equipment. Eels were marked with transmitters and monitored as part of telemetric studies over a long period of time. Unfortunately, no clear findings were possible regarding the exact significance of various indicators such as flow rate, moon phases, water temperature etc.

Studies and scientific investigations have also examined the possibility of setting up physical barriers and diversion systems. Investigations were conducted into the question with what justifiable technical and financial input special grating and bypass systems can be built at the hydroelectric power stations. The results showed significant problems in the positioning and dimensions of the grating systems and the risk of damage to the eels due to strong current speeds at the grating. Furthermore, the lack of knowledge about the behaviour of eels makes it impossible to make a definite statement about the possible ecological efficiency of the systems.

Currently, the idea of operating the hydroelectric power stations in a fish-friendly way during the highest period of migratory activity is being explored. Target water turbine admission should allow the eels to pass through without injury as far as possible. To identify the start of migratory activities as precisely as possible, the use of special fish-traps fitted with detectors is currently being investigated in the river Moselle because it has so far not been possible to develop a mathematical migration forecasting model.

Fields of activity and project aims of the EPI



Through a combination of fish-friendly turbine management and transporting adult eels to the Rhine, the Eel Protection Initiative hopes to create sufficient eel protection in the area surrounding the hydroelectric power stations. However, this can only represent a small contribution towards the comprehensive protection of eels in Germany and Europe.

During their complex life cycle, eels are exposed to many negative influences such as pollution, over-fishing of young eel stocks, climate change, diseases, parasites and predators. The eel population in Europe is therefore highly at risk; the number of young eels returning to the coasts has decreased to 2-5 %.

Competition and price wars for the remaining stocks of young eels are considerable and are to be regulated in future with a new EU eel regulation. The safe and unharmed migration of a minimum percentage of silver eels from the eel population of European river stocks will also help to maintain the stocks of the European eel.

The Eel Protection Initiative seeks to make an important contribution towards this in the river Moselle.

Transporting eels to the Rhine





The life cycle of the eel is characterised by long migrations through both the sea and inland waters. To reproduce and ensure the preservation of their species, the European eel must overcome obstacles in both upstream and downstream water systems in order to spawn in the Sargasso Sea, North East of the Caribbean. To this day, the rebreeding of eels has not been possible. The use of eels as food and for stock is therefore dependent on preserving the migration of spawn to the sea and the return of the young eels to the coasts of Europe.

Concurrently with the extension of the Moselle between 1958 and 1964 to allow large ships to sail on the river, 10 run-of-river power stations were built at the barrages. RWE Power operates the stations with a total installed capacity of 180 MW and an annual output of 800 million kilowatt-hours. Each power station has a discharge rate of 400 m³/s. It is possible for the eels to cross the barrages via fish passage pools and eel ladders in the weir pillars. A reduced number of eels that manage to cross the barrage weirs is compensated by stock measures.

However, stocks are being damaged during the necessary down-migration of the long-distance migratory eel. As eels largely follow the main current on the bed of the river, they swim in front of the intakes of the power station turbines.

Fishing eels with fish traps



Some of the eels turn around and can use other migration channels (weir, lock) depending on the water discharge. Due to their migratory instinct, they also pass through the turbines to get into the downstream water. As the damage caused by the turbine blades largely depends on the body length of the fish, migrating eels with an average body length of 60 cm are particularly in danger.

Back in 1995, an agreement on the joint Moselle Eel Protection Initiative was made between the Federal State of Rhineland Palatinate, the fisheries authority of the river Moselle, and RWE Power as the operator of the hydroelectric power stations. Within the framework of this agreement and in cooperation with scientific institutes, possible ways are being investigated to minimise damage to the fish and to strengthen the eel stocks in the river Moselle while taking into account economic aspects.

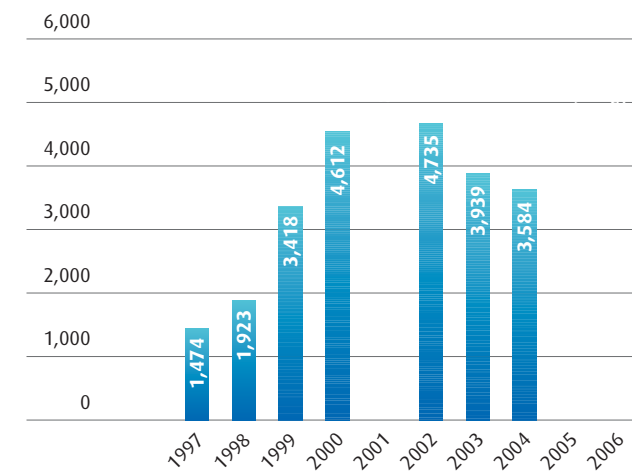
The Eel Protection Initiative is financed by RWE Power through the provision of the annual sum of € 215,000. Half of the funds are made available to the Federal State of Rhineland Palatinate as compensation for fishing-related measures, such as replenishing fish stocks. The other half is allocated to measures and projects to protect the eels. This sum has meanwhile amounted to € 1.3 million, of which around 2/3 has been used for bringing eels into the Rhine and around 1/3 for scientific investigations and studies. Working on the advice of expert institutes, both partners of the Eel Protection Initiative decide jointly on the appropriate use of the funds.

As an immediate form of help, migrating eels have been caught in a targeted manner by professional fishing operators assigned by the Eel Protection Initiative since 1997 and then carefully transported to Linz on the river Rhine. From there, the eels can continue their migration into the delta area of the Rhine without having to pass hydroelectric power stations. Thanks to this method, around 10,000-15,000 eels reach the river Rhine every year without suffering any damage.

The development of knowledge about eel biology and the geographic and temporal migratory behaviour of eels is the focus of the research work conducted by the Eel Protection Initiative.

Much information about e.g. the current eel population of the river Moselle is based on estimates; many statements relating to behavioural biology are suppositions. An exact statement about what percentage of eels migrates via the turbines or via the weir or locks is not possible. Scientific investigations and fishing are aimed at providing a sound base of data. However, such investigations require years and each migratory season has its own environmental conditions, making it more difficult to absolutely identify triggering factors regarding the migratory behaviour of the eels.

Fish yields (eels caught in kg)



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