



# Improving migration opportunities is a key action to saving the eel

**Eels used to be abundant in European coastal and inland waters. However, human impacts have caused the population to decline to alarming levels, and the species is now critically endangered. To support recovery of the eel population, effective measures are needed.**

Formas has been commissioned by the Swedish government to evaluate eel management in collaboration with a scientific evaluation panel. Among other actions, the panel recommends better solutions for the migration of eels past hydropower facilities, continuing the phasing out of eel fishery, and discontinuing restocking of imported eels.

## Eel migration faces obstacles

The eel is a fish that evokes emotions. Having eel on the Christmas table is a tradition for many, while there is widespread awareness of the eel's endangered status. The well-known fish with its peculiar shape has an unusual life cycle. They hatch in the Sargasso Sea, drift with ocean currents to our coasts, migrate in estuaries and water courses

and live there for tens of years before returning to the Sargasso Sea to spawn. If all goes well.

Today, there are many obstacles to the functioning of the eel life cycle. Hydropower dams impede access to suitable nursing habitats, and the eels risk being trapped in fyke nets. The eel is also threatened by environmental changes like draining of wetlands and aquatic pollutants. Only a fraction of the original eel population remains today.

## Management to preserve eels

To ensure that eels remain in our waters in the future, the EU has an Eel Regulation that obliges Member States to establish national management plans on measures to facilitate recovery of the stock and monitoring of targets. Although Sweden has had a plan since 2008, there are few signs of recovery of the eel stock.

The government has commissioned Formas to evaluate Swedish eel management. Formas has engaged an international panel of researchers.

## Conclusions and recommendations to improve eel management

- Reduction of the fishery
- Improving habitat connectivity
- Discontinue restocking
- Control of fishing
- Research
- Organisation



The panel has reviewed the eel management plan, read the research on eels, and interviewed people who are involved in the Swedish eel management in various ways.

## Main threats to eel recovery

The panel has formed an opinion about the main threats to eel recovery in Sweden. They rank the threats in this order:

- 1) lack of upstream and downstream migration success
- 2) illegal fishing anywhere
- 3) legal inland freshwater fisheries
- 4) small-scale coastal fisheries in the Baltic.

The Panel argues that a revised Eel Management Plan should prioritise realistic measures against these threats. In addition, the management plan should set achievable interim targets for the measures. It is also important that the plan describes how cost-effective monitoring should take place. Improving eel management is likely to require increased funding for both research and monitoring.

## Panel recommendations to improve eel management

### Reduction of the fishery

The Panel recommends that Sweden follows the intentions of the 2008 Eel Management Plan to gradually phase out fishing for eel. This means that Sweden should continue the current path of not granting new eel fishing licences or allowing the transfer of licences to new license holders. Fishing will thus continue to decline as eel fishermen retire or choose to stop fishing for eels.

The current annual fishing quota of 8000 kg per fisherman should also be reduced to 1000 kg or less. In freshwater systems where measures are implemented to increase the ability of eels to migrate past barriers, fishing licences should be terminated early. If a revised eel management plan is adaptive, it should eventually be possible to consider reopening fisheries, if eel stocks in Sweden recover to a level that allows this.

### Improved habitat connectivity

Since the Eel Management Plan was written in 2008, there has been little discernible progress in improving eels' ability to migrate in flowing rivers and in reducing mortality linked to hydro-power. This means that large parts of Sweden that offer good nursery areas for eels cannot be used because eels cannot get there.

There is therefore an urgent need to find rapid and comprehensive solutions to improve eel passage opportunities both upstream and downstream. This would provide nursery habitats for naturally migrating eels and reduce mortality associated with eel migration. It is important to provide both upstream and downstream passage opportunities at the same obstacles, and to prioritise improvements in all or large parts of a river basin.

### Discontinue restocking

Restocking of imported glass eels has likely increased eel catches in the Swedish eel fishery. But it is highly questionable to what extent restocked eels have contributed to increased spawning escapement and thus the reproductive stock. More and more research questions the effectiveness of restocking. Rather, there is growing concern that restocking is a high-risk activity. The Panel recommends the restocking in Sweden to be discontinued, including those performed by hydroelectric companies in inland waters.

### Control of fishing

Sweden has a well-developed system to ensure that fishing is carried out in accordance with the applicable regulations. However, the division of roles and mandates between the authorities that share fisheries control and law enforcement at sea is less clear and there is a need for streamlining and clarification. An obvious challenge is illegal fishing, which may be of the same magnitude as legal fishing for eel. Increased efforts are needed to prevent illegal fishing.

### Research

Research and monitoring to support Swedish eel management has primarily taken place at the Swedish University of Agricultural Sciences, SLU,

on commission from the Swedish Agency for Marine and Water Management. In general, the panel notes that SLU provides information, data, and analysis in support of the management, most of which is appropriately targeted to better understand key uncertainties underlying performance of the Eel Management Plan. Part of the work performed by SLU has been to prepare the basis for Sweden's recurrent reporting to the European Commission on the implementation of the national Eel Management Plan and the progress achieved in protection and recovering of the eel stock. The conclusions of these assessments have grown increasingly pessimistic over time.

Even if research at SLU is relevant, it is unclear whether there is capacity for all the research that is necessary. The panel notes that there does not appear to be extensive research at SLU on upstream or downstream passage options, nor capacity to assess the implementation of the Eel Management Plan as a strategic research question.

Increased funding would probably be required for large-scale research on improving eel upstream and downstream passage. Other types of research may be feasible within current funding, such as developing interim escapement targets. However, this requires research and development of more realistic population models, as well as projections of how management measures are implemented over time.

### Organisation

To improve migration, the panel believes that incentives are needed for the stakeholders concerned. This could, for example, involve subsidies, or accelerated processing, for those hydropower companies who are quick to implement solutions that facilitate eel migration. Furthermore, the panel believes that responsibilities and tasks should be clarified between the many types of organisations involved in eel management.

### How we did the evaluation

Formas has conducted the evaluation of the Swedish eel management from 2022 to 2024 in collaboration with a panel of international scientists. The evaluation panel has extensive experience of managing threatened fish species from around the world. The panel has used their knowledge of how similar fish can be managed effectively to contribute new perspectives on Swedish eel management.

To carry out the evaluation, Formas first produced a description of organisation and governance, to support the international panel. We made field visits and met with many of those who have a role in the

management. We have also carried out a number of sub-projects to compile information and support the panel's work. These projects were carried out by different research groups. In the final year, we assisted the Panel in their work and compiled the reporting.



**The report is available in English and Swedish at [formas.se](https://formas.se)**

### Do you have questions about the evaluation?

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