SEG position on the eel stock status, and our ambition for recovery

Sustainable *Eel* Group

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Introduction

The eel is nearly extinct - this is often claimed - necessitating a call for a total emergency, with all measures to protect and recover the stock. But is the most widespread, and until recently one of the most abundant inland fish in Europe, indeed in such dire straits and on the verge of extinction?

In this paper, SEG discusses its view on the state of the eel stock and evaluates the consequences for further protective action.

The historical abundance

To start, we go back in time nearly 150 years. In the River Danube, no eel occurred naturally. In 1881, there was an attempt to introduce the eel there: the Deutsche Fischerei Verein released a couple of thousand young eels at Ulm, on the shores of the Danube in Bavaria. What was the nearest site of abundant young eels, to source these transports? In Schaffhausen, just below the waterfall in the River Rhine between Switzerland and Germany, at approximately 1000 km from the sea, one could scoop up buckets full of young eels. In present times, not much eel is left in Schaffhausen – if any eel is left there at all.

Across the distribution area of the eel, from the North Cape to the Nile Delta, anecdotal stories and historical evidence bear witness of an incredible abundance and a wide spread of the eel, to almost all waters with a connection to the sea.

Glass eel in front of the sluices in Den Oever, the Netherlands, April 1958.

All along the coast, and upstream far inland from the sea, up into the north of Scandinavia, deep into Russia, in North African rivers that since dried up, and in all streams and ponds in between – eel was everywhere.

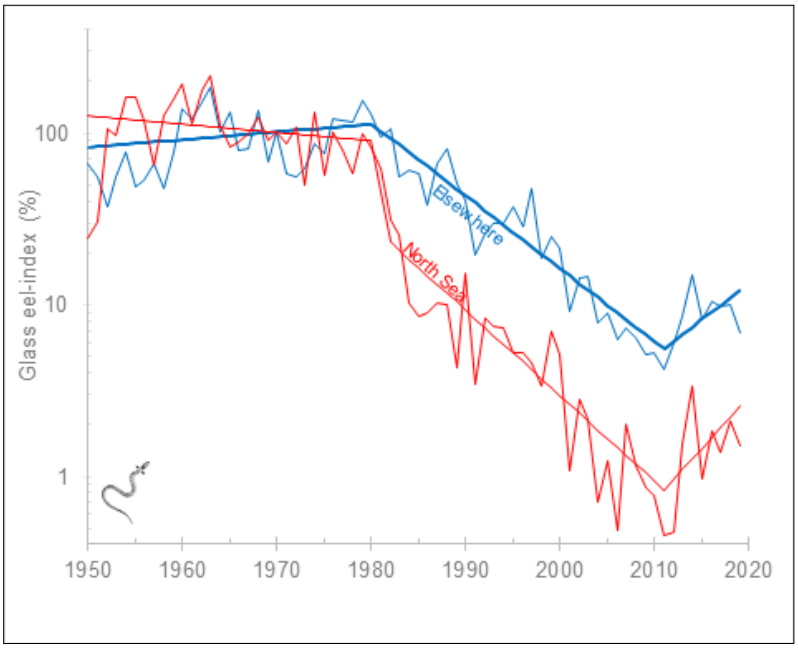
The decline in our time

While there is circumstantial evidence that the eel stock has been in decline since the 1800s, the fisheries of that time modernised, expanded, and developed into new markets. In the late 1950s, the fisheries reached a peak – but ever since, the catches have been in a slow and consistent decline - about 5% down per year - throughout the distribution area.

While a catch of almost 25,000 tonnes was recorded in 1960, today's catch is not more than 2,500 tonnes. Independent abundance indices indicate that the stock was in decline, and the diminishing catches reflected that.

Meanwhile, until 1980, the recruitment of young eel (glass eel) from the ocean remained high - but in the years since 1980, their abundance declined approx. 15% per year, to only 1-10% of the abundance before. In most recent years (since 2011), the decline has come to a halt, and recruitment has increased, approx. 15% per year up again.

Current glass eel recruitment is still very low, but fortunately no longer in decline, and even slightly on the rise.



Trends in the abundance of young eel arriving at the European continent (Data: ICES 2019; linear trend lines added for 1950-1980, 1982-2011 and 2011-2018. Note logarithmic scale of the vertical axis).

Is the eel nearing extinction?

The eel has been slip-sliding away, for half a century or more. Is there a realistic risk of extinction? Evidently, if nothing had been done, and the downward trend not halted, then there was a real risk of extinction one day. But how realistic is that right now? The mysteriousness of the eel has often been described. Many aspects of the eel's biology, including its reproduction in the far away Sargasso Sea, are still largely unknown. Not knowing these critical processes, how could anybody assess the extinction risk with any reasonable certainty?

The International Union for the Conservation of Nature (IUCN) applies a rigorous framework of fixed criteria to all plants and animals alike, aiming to assess the risk of extinction for all those biota. Based on these assessments, IUCN compiles a red-list of threatened species. Though the IUCN criteria do not address the peculiarities of any individual species, and certainly not those of the eel, the application of a standardised framework is definitely a major asset, which prevents a lot of trivial discussions. For the eel, IUCN (2014) concluded on a status as 'Critically Endangered' (CR), primarily informed by the rapid downward trends in the stock (80-90% down over three generations), as per their framework. This CR-status is explained as 'facing an extremely high risk of extinction in the wild'; that is the last status before becoming 'Extinct in the wild'.

However, SEG considers that the labelling of the CR-status is misleading. For the CR-status, five criteria apply: four criteria refer to the size of the population or the extent of its distribution area, and one criterion refers to the rate of decline of those other abundance indices. Four criteria for the absolute abundance, one for a relative rate of decline. *Four criteria telling me that I am bankrupt, one criterion*

telling I am over-spending. As relevant as both types of criteria can be, SEG considers that these have incorrectly been merged under one label: a worrying rate of decline is fundamentally different from a worrying state of near extinction. *An over-spending millionaire has a much better chance to survive than a bankrupt pauper.*

Migrating eels on the River Tone, UK, 2014

By merging all of these into a single category, IUCN creates a misconception that the eel is nearly extinct, which the eel is not. The stock has been in a multi-decadal decline, but it is still far away from extinction.

It is still the most wide-spread fish in Europe, and it is still one of the more abundant species in inland waters, with numbers recruiting over the thousand million individuals each year.

The suggestion of a realistic extinction-risk is misleading and distracts attention from the much-needed protection.

What can be done?

The eel stock is at a historical low and has been in decline for many decades. In 2007, the Eel Regulation was adopted, to protect and recover the stock. The Eel Regulation formulated a long-term objective: to recover the abundance to 40% of the natural, pristine stock. That pristine stock then entails a high glass eel recruitment, no man-made mortalities (fisheries, water works, pollution, pumps and turbines), and fully available and accessible natural habitats across the distribution area. As attractive as such a completely recovered eel stock sounds, it is very far away from the current situation. It even remains to be seen whether this ultimate goal is achievable anyway: it might well be that we have irreversibly altered the habitats too much. But the only way to find that out, is to try. And for that, there is only one way to achieve it: to improve the survival of the eel in the currently depleted stock and to restore (access to) lost habitats. Then, we have to keep that protection for as long as it takes. A higher survival is our only means to achieve our ends: a recovered stock.

The unbridgeable gap between the current abundance and the long-term objective of 40% has been heavily criticised, and we now add a discussion on the equally unbridgeable gap between the current state and anything near extinction. In doing so, those discussions (SEG included) mix up the means and the objectives: it hardly matters how the current abundance is – it is only an adequate protection that counts now.

Adequate protection is the only way to achieve the recovery – and achieving adequate protection is the only thing we can actually do right now. If all is well, the stock will then recover – but for now, focus should be on reaching that protection level.

Are we making progress?

Three decades ago, discussions began in scientific meetings on what to do with the deteriorating state of the eel stock. Two decades ago, the International Council for the Exploration of the Sea (ICES) advised to compile a recovery plan for the sustainable exploitation of the eel stock across Europe. One decade ago, such a plan was adopted (the Eel Regulation) and implemented in national Eel Management Plans. So where are we now, and where do we want to be in another decade? Below, we will discuss the eel, the protection, and the societal discussions.

The eel stock has been in decline for many decades, and glass eel recruitment fell rapidly from 1980. Protective measures being taken from about 2009, there has been little time for the stock to react to that yet. Since 2011, however, the downward trend in the glass eel has come to a halt, to be replaced by an equally fast upward trend. It is not clear, whether this initial recovery is directly caused by the protective measures taken since the Eel Regulation was adopted, and we know for sure there is still a long way to go. But the least we can say is that the observed trend is in agreement with the measures taken, and those measures are certainly not proven ineffective by the trend observed.

Left, thousands of eels attempt to migrate up Tewkesbury weir, River Severn, UK.
Right, an eel pass constructed in 2018 allows them to migrate.

Are we making progress? Yes, protective measures have been taken in all EU Member States, predominantly concerning the fisheries (i.e. non-fishing impacts have been addressed much less). Has the agreed minimal protection level been achieved, and does that now allow recovery of the stock? In some countries and areas it has, but in many others, that protection has not been achieved yet, and additional measures are needed.

In these circumstances, we cannot expect the stock to recover, and comparing the current situation to the long-term goal (40%) is simply not a productive process. To succeed, the protection needs to be improved to the minimal level, across the distribution area. That is the first priority.

Where to go next?

In today's discussions, two themes dominate. First, there are those that claim that the eel stock is critically endangered, near extinction. Then, there are those that stress that the Eel Regulation is not effective enough, since the stock has clearly not recovered to the full historical abundance yet.

While the first line of thinking brings us back to square one (the stock is in bad state!), the second line of thinking peeks forward, to the final target (the stock is not fully recovered yet!).

Glass eel catches across Europe average about 50 tonnes per year, 150 million fish, 10% of the estimated stock.

In SEG's view, the actual situation is neither dangerously close to square one nor within sight of the final goal – we are in a middle ground, where our attention must be on making progress. It will be important to focus societal discussions on the protection levels, as required and achieved. Neither square one, nor the final goal, is very helpful for that.

Thousands of migrating silver eels are killed in hydropower turbines and pumps

In particular, SEG aims to accelerate the recovery of the European eel.

While the Eel Regulation did not set a specified time frame for achieving adequate protection ('achieving this objective in the long term'), SEG now calls for:

- evaluating achieved protection levels for all countries within two years from now,
- improving the implementation structurally in five years, and
- reaching the agreed minimal protection in all Eel Management Units within ten years from now.

The young eels, that immigrated our rivers in spring 2020, deserve sustainable protection within their lifetime!