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Pedersen, M. I.; Rasmussen, G. H.

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Fisheries regulation on European Eel (*Anguilla anguilla*) for 2018; how big is the effect?

Pedersen MI *, Rasmussen GH

Fresh water Fisheries and Ecology, Danish Technical University, Vejlsøvej 39, DK-8600 Silkeborg, Denmark

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Effect of Eel Regulation for 2018

The EU Council of Ministers decided in December 2017 to implement a limitation on commercial marine catches on eels exceeding 12 cm in length for 2018. We aimed to evaluate the effect of the fishing limitation using data on actual and potential silver eel escapement (stock indicators).

The data suggest that fisheries exploitation of adult eels in the marine areas has relatively little effect on the biomass of silver eel that potentially can escape to the spawning grounds in the Sargasso Sea. The 2018 fishing regulation for the marine commercial fisheries increases migrating of silver eels towards the spawning grounds in the Sargasso Sea, from expected 10,000 t to 10,200 t, equivalent to 2% increase. Other anthropogenic mortality and predation may be far more important than landings of all life stages and account for 49% of the total loss.

Stock Status and Management

A management framework for eel was established in 2007 [1] through an EU Regulation. The objective of the regulation is the protection and recovery of the eel stock. To achieve the objective, EU member states have developed eel management plans (EMPs) for their river basin districts. The EU eel Regulation has not yet resulted in increased recruitment of glass eels and are at a historical low level [2]. The amount of glass eel arriving at European coasts was in 2017 less than 10% compared with the period 1960-1979 [2]. ICES advice has remained unchanged since 1999 and reads-"all anthropogenic impacts (e.g. recreational and commercial fishing on all stages, hydropower, pumping stations, and pollution) that decrease production and escapement of silver eels should be reduced to- or kept as close to-zero as possible". Acting on the advice from ICES the EU Council of Ministers decided in 2017 to implement a limitation on eel catches but focused only on the commercial marine fisheries of eels exceeding 12 cm. The limitation consists of a three-month coherent closed period during 1. September 2018-31. January 2019. The closure does not cover freshwater fisheries or recreational fisheries.

The data used to evaluate the loss of eels are stock indicators reported by EU member states for the 2015 post evaluation of the eel regulation [3]. Current potential escapement is estimated at 30,680 t and actual escapement before the 2018 regulation is 10,000 t [4].

The data in Table 1 assume a steady state situation of eel biomass lost to fisheries and other anthropogenic causes including predation.

Landings of Eel

The total landings in the marine fisheries in Europe (the Mediterranean, North Sea, Atlantic and Baltic Sea) were c. 800 t in 2014 (FIDES data) [4]. Denmark's Fisheries Association estimates that the 2018 regulation will reduce the marine landings with about 25%. The Danish landings will thus be reduced from 250 t to 190 t and in Europe probably totally from 800 to 600 t. Thus, the regulation will increase escapement of silver eels from 10,000 t to 10,200 t, equivalent to 2% increase.

Freshwater landings in Europe are far greater than the marine fishery about 3,700 t [3]. If all fishing in fresh and salt waters of adult eel (yellow and silver) throughout Europe ceases, the eel biomass that survives and migrates toward the Sargasso Sea, increases from 10,000 tons to 15,900 t, corresponding to an increase of 59%.

The official glass eel landings in 2014-2016 were c. 60 ton. In 2016 12 t (20%) could be identified as being restocked somewhere in Europe [5] and 48 t were exported to aquaculture, consumed directly or of unknown use. Restocking is likely to affect escapement of silver eels in local areas where they are stocked, with a time lag from glass to silver eel of 4-7 years in Southern Europe and 10-20 years in Northern Europe. In the perspective of a steady state situation, glass eel landings may account for 23% biomass loss. If glass eel fisheries not stocked ceases (i.e. 48 t) the eel biomass that survives and migrates toward the Sargasso Sea, increases from 10,000 tons to 14,800 t.

The total recreational landings in Europe are badly known, but an estimate shows that it is between 7 and 32% (215 and 1,440 t) of the commercial landings in fresh and saltwater, but there is likely an underestimate of the true recreational landings throughout Europe [3]. The upper figure of 1440 t is used in Table 1.

Table 1. *Expected escapement and loss of eel biomass after the 2018 eel regulation. Other anthropogenic causes include, damming, hydropower turbines, pumps, drainage, pollution. "Actual escapement" is the biomass of silver eel migrating towards the Sargasso Sea beyond any fishing gear.* (*It is estimated that 1 kg of glass eel potentially could contribute to 100 kg silver eel biomass).

Loss of eel biomass	Tonnes	Share (%)
Commercial landings, Marine	600	3
Commercial landings Freshwater	3,700	18
Glass eel landings (not restocked)*	4,800	23
Recreational landings	1,440	7
Other anthropogenic causes and predation	9,940	49
Total loss of biomass	20,480	100
Actual escapement	10,200	
Potential escapement	30,680	

Other Anthropogenic Mortality and Predation

Other anthropogenic mortality caused by industry and agriculture (damming, hydropower turbines, pumps, drainage and pollution) as well as predation from e.g. cormorants may constitute up to 49% of the total loss. The figure includes all mortalities that are not accounted for including illegal and unreported fisheries e.g. unreported glass eel landings.

Conclusion

These data demonstrates that glass eel fisheries and freshwater fisheries are far more important than the marine fisheries and the closure of marine fisheries have a limited effect on spawner escapement.

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*Correspondence to:

Pedersen MI

Fresh water Fisheries and Ecology

Danish Technical University

Silkeborg

Denmark

Tel:+45 35883128

E-mail: mip@aqua.dtu.dk