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AKVV 09/3004

Bijlagen
2

Datum 3 september 2009
Betreft ICES rapport

Geachte Voorzitter,

Op uw verzoek bied ik u het rapport aan van ICES (International Council for the Exploration of the Sea) betreffende de beoordeling van het aanvankelijk ingediende Nederlandse Aalbeheerplan. Dit onderzoek is uitgevoerd in opdracht van de Europese Commissie, en maakt onderdeel uit van een beoordeling van alle aalbeheerplannen van de Europese lidstaten. Bovendien betreft dit een tussentijds advies over het aalbeheerplan dat ik 3 april 2009 naar de Europese Commissie heb verzonden. Op mijn aandringen en na intensief overleg met de Europese Commissie is het rapport toch door de Europese Commissie vrijgegeven. Tevens bied ik u aan de samenvatting van het rapport van de EIFAC/ICES aalwerkgroep. Deze werkgroep rapporteert jaarlijks over de stand van de aal. Bij de beoordeling van het Nederlandse plan baseert ICES zich mede op deze eerdere rapporten. Het volledige rapport is te vinden op:
http://www.ices.dk/reports/ACOM/2008/WGEEL/wgeel_2008_final.pdf.

De meest cruciale afwegingsfactoren van ICES betreffen de schatting van de hoeveelheid schieraal die zou kunnen uittrekken bij een situatie zonder menselijke invloed, en de kwantificering van het effect van de maatregelen. ICES is het niet eens met de door Nederland op basis van het advies van de commissie Eijsackers naar beneden bijgestelde uittrekdoelstelling. Het door Eijsackers c.s. aangevoerde effect van dichtheidsafhankelijkheid en voedselbeschikbaarheid wordt door ICES geringer ingeschat. Dit is van belang omdat het maatregelenpakket is gebaseerd op de uittrekdoelstelling. Door een te lage uittrekdoelstelling als uitgangspunt te nemen resulteren de maatregelen in een onvoldoende effect.

Vervolgens concludeert ICES (onder 7a) dat een vermindering van de aalsterfte tot het niveau waarop de visserij-inspanning wordt teruggebracht tot minder dan 15% van de huidige visserij-inspanning, noodzakelijk is om op de korte en middellange termijn de teruggang van de aalstand te stoppen. Het aanvankelijk door Nederland ingediende aalbeheerplan voldoet niet aan deze doelstelling. Nederland is hierover afhankelijk van de effectiviteit van de maatregelen van andere EU-lidstaten om de doelstelling om de teruggang van de aalstand te stoppen te realiseren.

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Als alternatief zou overwogen kunnen worden om een zeer grote hoeveelheid glasaal uit te zetten. ICES geeft aan dat hiervoor een vangst van 80-130 ton glasaal noodzakelijk is. Los van de kosten (glasaalprijzen variëren van € 500-1000 per kilo), is het ook onmogelijk om deze hoeveelheid glasaal aan te kopen. De totale glasaalvangst in Europa bedroeg de afgelopen jaren ongeveer 100 ton per jaar, en de meest recente gegevens van ICES laten een verdere teruggang met 40 tot 50% zien.

Omdat de huidige intrek van glasaal zich op een historisch laag niveau bevindt en de daling van de stand van de aal onverminderd doorzet, zal het herstel veel tijd vragen. Daarom adviseert de EIFAC/ICES aalwerkgroep reeds jaren om de externe mortaliteitsfactoren, zoals de visserij, zoveel mogelijk naar nul te reduceren. Op basis van dit advies van ICES heeft de Europese Commissie geoordeeld dat het aanvankelijk ingediende Aalbeheerplan niet te kunnen goedkeuren en dat aanvullende maatregelen, zoals sluiting van de aalvisserij gedurende een vastgestelde periode, noodzakelijk is.

DE MINISTER VAN LANDBOUW, NATUUR EN
VOEDSELKWALITEIT,

G. Verburg

Evaluation of EMP for MS Netherlands – Version 2 after receiving additional data and analysis from the NL on stocking, effect of measures, recovery time and "Third opinion" on target.

1. **Compatibility/consistency of methods used to estimate biomass in shared river basins;**

    a. **General:**

Four river basins extending beyond national boundaries are recognized by the plan: the river Ems basin shared with Germany; the River Rhine shared with Germany, Luxembourg, Switzerland, France, Austria, and Liechtenstein; the river Meuse basin covers Belgium, Luxembourg, France, and Germany; the river Scheldt basin shared with Belgium and France. The existing international river commissions related to this area have a long history of coordination on water quality issues. Coordination related to fisheries management is in the formative stages. For this reason the Dutch have submitted one national plan.

    b. **Special attention devoted to the Baltic Sea and European waters falling outside the scope of Directive 2000/60/EC in the context of transboundary coordination as specified in the preamble (11) of Council Regulation (EC) No 1100/2007:**

Not an issue in this area.

2. **Estimate of silver eel escapement;**

    a. **Reliability of methods used (Is the model scientifically sound and is it supported with sufficient and reliable data), as referred to in Article 2(5) of the Regulation to calculate potential silver eel escapement:**

The Dutch methods for estimating targets for silver eel migration are based on yields and the available production area (Dutch EMP, p. 43). The EMP reports of an internal debate on the reliability of existing data and suitability of method applied.

i. Estimate of pristine escapement:

Two methods provide an estimate of 10 000-15 000 tonnes independently of each other. This translate into a target of 4000-6000 tonnes. A "Third opinion" estimate gives a target value of 2600-8100 tonnes (and thus total escapement of 6500-20250 tonnes) without considering density dependent factors and states that it is most probably lower than 4000-6000 tonnes if density dependent effects and carrying capacity are taken into acount. We evaluated the "Third opinion" analysis and found that the density dependent factors are weaker than indicated and that carrying capacity is higher than suggested (see Annex 1). We were not able to point at one estimate as better than the other. As the aim is to get one value the mean of the first interval is 12500 and the other is 13375 tonnes, it seems reasonable to set the pristine escapement to 13000 tonnes.

ii. Estimation of current escapement:

Current escapement is reported to be 400 tonnes of silver eel. Of this total, 200 tonnes is estimated to be originating from neighboring countries (primarily produced from the Rhine RBD) and 200 tonnes is attributed to eels originating from the Netherlands.

iii. Current potential escapement given no fishing:

1120 tonnes (2004 values) is caught in the commercial and recreational fishery. If this fishery is stopped the potential escapement corresponds to at least this amount plus the 200 tonnes already escaping giving an estimate of 1320 tonnes of silver eel escapement.

iv. **Current potential escapement given no anthropogenic mortality at all:**

To estimate potential escapement without anthropogenic mortality 61-167 tonnes (Table 2.4.1) must be added to the current potential escapement given no fishing, for mortalities from hydropower and water pump stations, plus an unknown fraction of mortality related to barriers. This will result in a 1381-1487 tonnes plus an unknown fraction due to barriers.

b. Accuracy (estimated range or confidence intervals) of estimates of current and pristine silver eel escapement:

Based on the information provided in the EMP, the accuracy has been subjectively determined to be medium.

c. Coherency of estimates for shared river basins:

The plans of shared basins are yet to be received at ICES.

d. Compatibility of methods used for shared river basins:

The plans of shared basins are yet to be received at ICES.

3. **Restocking**

a. Expected contribution of restocking measures to reaching the escapement target:

The plan is to stock with at most 1000-1600 kg of glass eels and that is claimed to result in 100 tonnes of silver eel escapement in 2027 (p.24).

b. Appropriateness of areas and times selected for restocking with respect to restocked eels completing their inland lifecycle and beginning their spawning migration from the restocked area:

Specific geographical areas have not yet been identified. However, it is apparent from the EMP that there will be suitable areas for restocking measures. An independent stakeholder organization, *Future for Eel* will coordinate restocking efforts.

c. Does the EMP include the requirement for reserving 35% increasing to 60% of eel less than 12 cm caught (live and dead glass eel), for stocking (Article 7, (1 &2)?

The Netherlands does not have a commercial catch of glass eel.

4. **Quantification of expected contribution (in terms of silver eel biomass) of each proposed measure towards the achievement of the escapement target:**

The plan quantifies silver eel escapement related to each proposed measure on p. 33 (Dutch EMP) and in Tables 3-2 to 3-4 in Klein Breteler (2009, Eel Management Plan The Netherlands. Supplement: ICES Comments). The values based on analysis by Klein Breteler (2008) are focusing on individual measures implemented and the amount of survivors. It is assumed that they are not dying due to other causes. This is of course an unrealistic assumption and the aim of the calculations is only to indicate the relative effectiveness of each measure against the others. Improvements of survival at pumping stations, fishing free zones and angling and recreational fishing are the most important tools in the medium to long term.

5. **Achieving with high probability and in the long term, the escapement to the sea of at least 40% of silver eel biomass relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock (Regulation (EC) 1100/2007, Article 2 (4);**

There is no overall effect given for the impacts of proposed measures on silver eel escapement in the short, medium, and long term.

a. **Time schedule for the attainment of the target level set in Article 2, (4 & 9):**

i. **Reported time schedule for reaching the 40% goal:**

Not given.

ii. **Intermediate time schedule reflecting the 'gradual approach':**

Not given.

iii. **Measures as of the first year:**

Measures planned for the first year of implementation (2009) include: Mitigation of impacts from migration past barriers and hydroelectric stations including transport and release of silver eels. Restrictions on the fishery include fishery-free zones, measures to limit impacts from angling in both marine and inland waters, and restocking.

iv. **Expected recruitment level:**

Not given.

v. **Likelihood/probability of achieving the target within the timeframe mentioned:**

No timeframe given. The Netherlands plan of achieving the target will dependent on an almost complete recovery of the natural recruitment to the pre-1980 level.

b. **With two or more plans, achieving the 40% target for all or as national average:**

N/A

6. **Inclusion of adequate measures to monitor and verify successful implementation of the plan(s); Monitor and verify management target:**

Research has begun in 2008 for the development of an eel monitoring program.

7. **Qualitative analyses of the plan(s);**

a. **Qualitative analysis of possible effectiveness of the (each) plan as a whole:**

As discussed above the main issue with the Dutch EMP relates to the assumption of recruitment recovery in the long term to the pre-1980 level. This assumption is dependent on the impacts of measures related to the eel Regulation at a pan-European scale.

Short- and medium-term improvements of survival in eel of a similar magnitude as a reduction in fishing intensity to less than 15% of the present level is needed for reversing the downwards decline in the eel stock. As the Dutch EMP is not resulting in this level of improved survival of eel in the short and medium term the Dutch plan will only be effective if other countries are compensating for this shortage.

Alternatively*, if the aim is to use stocking to reach the target and be independent of natural recruitment, restocking could be increased to about 40 times the planned restocking, i.e. 40-64 tonnes of glass eel (0.3 g). Taking into account the mortality in the process of catch and transport, this corresponds to a catch of glass eel of 80 – 130 tonnes.

b. Qualitative analysis for plans pertaining to a shared river basin:

The plans of shared basins are yet to be received at ICES.

8. *Possible negative impact of one plan on the effectiveness of other plans for shared river basins, parts of the Baltic Sea area, and and European waters falling outside the scope of Directive 2000/60/EC in the context of transboundary coordination as specified in preamble (11) of Council Regulation (EC) No 1100/2007:*

The plans of shared basins are yet to be received at ICES.

*This should not be viewed as a recommendation/endorsement to necessarily rely on stocking to reach targets but is one possibility and is part of the larger evaluation of EMPs where the intention is to sum the possible need for comparison with the available supply.

Annex 1.

Copenhagen 9/7-2009

ICES consideration of the "Third Opinion"/ Eijsackers commission report NL EMP.

There is unfortunately a lack of historic data on eel stocks and habitat to support the development of precise estimates of pristine silver eel escapement. Therefore, a balanced judgement of the data and analysis available are needed. ICES strives to do that objectively and free of political influence. The main points in the so-called "Third Opinion" or Eijsackers commission report seem to be (taken from the Conclusions):

"The models used by IMARES and VIVION for their target scenarios

- are generally accepted methods and in line with the eel Regulation of the EU. They were applied correctly but less suitable for the calculation of a natural reference population if they are based on unfished populations

Neither method took sufficient account of factors that played a role before 1980 like

- Density related mortality and growth (IMARES), and
- Eutrophication and cormorant predation (VIVION) –

If these had these factors been taken into account, target scenario numbers would have been lower."

Regarding the first bullet point ICES WGEEL (see: EG WGEEL ICES CM 2008/ACOM:15 - http://www.ices.dk/workinggroups/ViewWorkingGroup.aspx?ID=75), consisting of about 40 of the worlds leading experts in eel biology, found that generally the methods used by IMARES and VIVION are appropriate for this specific purpose. This is not to say that ICES cannot be wrong, but we are then talking about breaking new ground scientifically. The "Third Opinion" work and report provides good input to the ICES process of constantly striving to improve the scientific foundation of the advice. The ICES scientific community will take this into consideration in their further work on improving the basis for the eel advice.

At this stage we would like to point out that maybe the difference in opinion is not very large. To illustrate this, we focus on the scenario analysis presented in Fig. 1 in the "Third Opinion" report:

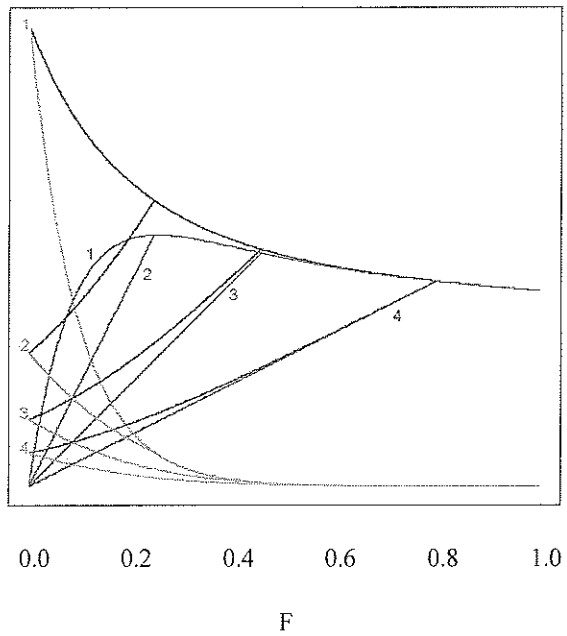

Fig. 1. Silver eel migration is indicated in green lines harvested brown eel in red as function of fisheries mortality F. The black lines give the sum of migration and harvest. Calculations are based on the Committee's simple model which takes account of the density related natural mortality of the smallest and unfished year classes. The lower the carrying capacity, the higher mortality rates here. The results given are based on 4 assumed carrying capacity scenarios: (1) in which carrying capacity is limitless; 2) in which carrying capacity is 50 kg/ha; 3) in which carrying capacity is 25kg/ha; (4) in which carrying capacity is 12.5 kg/ha.

The carrying capacity values used are all, except of course option 1), on the low side of the realistic values-judged from studies mainly in other countries than the Netherlands. In Denmark for instance, direct measurements of silver eel escapement have shown values in excess of 50kg/ha meaning that the standing stock biomass carrying capacity must at least be that high and probably significantly higher. Tesch (Tesch F. W. The Eel. (2003) 3rd edn. Blackwell, London. 416) gives several examples of over 100 kg/ha standing stock biomass of eel. He also lists biomasses of New Zealand eels, two very similar species to the European eel. These are interesting because they are closer to the pristine situation due to quite undisturbed rivers and lakes and little fishery. These values are several factors higher than 100 kg/ha so there seem to be little reason to suspect that from an ecosystem point of view there should be problems with high biomass values and thus high carrying capacity. Thus, for Dutch waters, which are to be counted as well suited for eel, carrying capacity are probably higher than the scenario 2)-4) shown in the Fig. 1. A more realistic figure is well above 100 kg/ha. If we extrapolate from the plot in Fig.1 with carrying capacity of 100-200kg/ha, escapement is higher than the catch. Thus, the method by VIVION is probably rather an underestimate than an overestimate, because it is unlikely that fishing in the past was at Fmax and that all catch was reported.

It is agreed that eutrophication level and cormorants density probably were different in the pre-1980 period compared to the real pristine period, but so were other factors like wetted areas and predators on eel predators (i.e so-called second order effects), working in the opposite direction. Furthermore, the Eel Regulation specifically states in Article 2, 5 (a) "use of data collected in the most appropriate period prior to 1980, provided these are available in sufficient quality and quality."

In conclusion we maintain that our suggested target of 5200 t silver eel escapement is a balanced estimate of the 40% pristine silver eel escapement target, based on the data and analysis available.

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Leuven, Belgium, 3–9 September 2008

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Abstract

Available information on recruitment, stock and fisheries continues to support and reinforce the advice that the European eel stock has declined in most of the distribution area and is outside safe biological limits. Recruitment of glass eel to the continental stock continues to decline with no obvious sign of recovery. Current levels of anthropogenic mortality are not sustainable and there is an urgent need that these should be reduced to as close to zero as possible, as soon as possible. All glass eel recruitment series demonstrate a clear decline since about 1980 with no sign of recovery. The Baltic indices of young yellow eel recruitment demonstrate a clear decline since about 1950. The decline in recruitment appeared stronger in the more northern and southern parts of the distribution.

In the 1970s, recruitment of glass eel was still at historically high levels indicating that Spawning Stock Biomass was not limiting the production of recruits at that time. Quantifying the 1970s spawner escapement therefore is the simplest derivation of a restoration threshold. The reference threshold should be set at 100% of the 1970s silver eel escapement where data are available, or in the absence of data, at a percentage (40%) of the notional pristine state which would have existed if no anthropogenic mortalities had impacted on the stock.

It is of utmost importance that existing recruitment monitoring is continued and improved, easing the dependence on commercial fisheries, and extended where inadequate. A radical improvement in the assessment of the current state of the stock, including quantification of the impact of anthropogenic mortalities, is urgently needed. Although comprehensive datasets exist in some river basins, this assessment will not be achievable in most river basins from currently limited data. Data discontinuities are likely to occur simultaneously and unlike in the past, statistical modelling will not be able to correct for this.

The first post-evaluation of the EU Regulation is required by mid-2012. Timely development of stock-wide assessment procedures is required, geared to the data becoming available, while indicating the progress towards recovery of the stock. The absence of any internationally driven requirement to maintain a recruitment dataseries needs to be corrected, with reference to the recommendations of the EU contract 98/076: Establishment of a recruit monitoring system for glass eel. The current legislative instruments including the Eel Regulation, DCR, CITES and WFD do not, either individually on in combination, contain sufficient provisions to ensure adequate data supply for such assessments.

It is suggested that managers define interim targets for the management measures in order to integrate local action efficiently to the aim of long-term recovery of the European eel stock. For this purpose sub-targets defining the magnitude of management measures will be linked with eel sub-targets reflecting the expected short-term response of the local eel population. Eel sub-targets should therefore allow a fairly rapid evaluation of the management measures taken but sensitivity and time response of some of the proposed eel sub-targets would need further investigation before their application would be operational. Eel sub-targets should finally be integrated into the evaluation of the status of the whole eel stock. However it has to be recognized that adequate methods, or modelling approaches, for achieving this are still lacking.

There are few quantitative estimates of pristine (pre-1980) and current silver eel production (Regulation EU 1100/2007) to allow comparisons to be made between systems

and there is few data on the importance of estuarine and coastal populations to overall production. Modelling will be needed to transfer estimates from data rich to data poor systems. Some approaches have been outlined by this Working Group which compliment those presented in previous working groups and in EU SLIME (Dekker *et al.*, 2006).

Implementation of EMPs requires the development of methods to obtain silver eel escapement data. They can include either direct (e.g. mark-recapture) or indirect measures (yellow eel proxies to determine habitat-based silver eel production). Use of direct methods, though preferable in many respects, will be severely restricted by uneven distribution of silver eel fisheries within and between regions, limited fishery monitoring resources and extreme fluctuations in river flows during migratory runs affecting the efficiency of capture methods.

A variety of indirect methods, mostly dependant on yellow eel proxies and modelling, are available for areas where direct measurements of silver eel escapement are not possible and should be extensively used to estimate regional and national silver eel escapement. Validation of indirect methods should be undertaken on an ongoing basis for a network of river systems where reliable direct estimation of silver eel escapement biomass is possible. Direct assessment of silver eel may, however, not inform on the impacting factors that require management, where yellow eel monitoring and assessment would be more informative.

Estimation of effective spawner biomass requires quantification of the adverse effects of contaminants, parasites, diseases, low fat levels, non-lethal turbine damage, along the lines previously proposed for *Anquillicola crassus*, as well as other mortality rates throughout the river basin. Present knowledge does not fully permit quantitative assessment of the effects of these factors on the overall stock. The European Eel Quality Database (EEQD) has been updated with data on contaminants, parasites and fat levels in eel, allowing the compilation of an overview of the contaminant load in eel over its distribution area. The data are highly variable within river basin districts, according to local anthropogenic pollution, linked with land use. Persistently elevated contamination levels, above human consumption standards, are seen in many European countries. Fat content of the yellow eels (i.e. in Belgium and the Netherlands) has decreased over the last number of years, which raises concern regarding the migratory and reproductory success of silver eels. *A. crassus* is spreading further into new areas and new data indicate the presence of the nematode in Canada for the first time.

At present, it is estimated that around 7.5 to 15% of the glass eel catch is used for stocking, either directly or as on-grown eels. Estimates suggest an insufficient supply of glass eel from the total fishery for stocking to full capacity at the European level. Nevertheless, the Regulation 1100/2007 requires that 35%, rising to 60%, of glass eel catches are made available for stocking to enhance the stock. If these percentages were applied to recent annual catches of glass eel, the potential lifetime effect of this increased level of stocking, in the absence of anthropogenic mortalities, could be in the same order of magnitude as current fisheries or eel culture. However, there is a continuing and urgent requirement for robust evidence of the extent to which stocking and transfers on local, national and international scales can increase silver eel escapement and spawner biomass.

The risks remain of disease and parasite transfer via stocked material, both from stocking glass eel and on-grown eels. For example, eels in aquaculture infected with pathogens (viruses, etc.) should not be used for stocking purposes. At least half the countries surveyed (17) do not have formal stocking protocols. These should include procedures to prevent the introduction and spreading of parasites and diseases, and

eel should be included in the European fish disease prevention policies to help minimize the risks.

Sufficiently long time-series of glass eel recruitment, covering several periods of the natural climatic oscillation over the North Atlantic, reflect the same periodicity. However, the causal link between climate and recruitment strength, is unknown, as well as where and when ocean environmental factors operate on the eel. As long as the causal factors of oceanic influence are unknown, it is not safe to assume that the decline is explained by climate alone, especially while anthropogenic influences are known to be large and better understood. The fact that oceanic climate may contribute to recruitment variation is not grounds for abstaining from all possible measures to increase silver eel escapement to boost spawning-stock biomass. The recent, prolonged strong decline in eel recruitment is out of phase with the dominating climate cycle, the North Atlantic Oscillation.

FAO European Inland Fisheries Advisory Commission; International Council for the Exploration of the Sea.

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