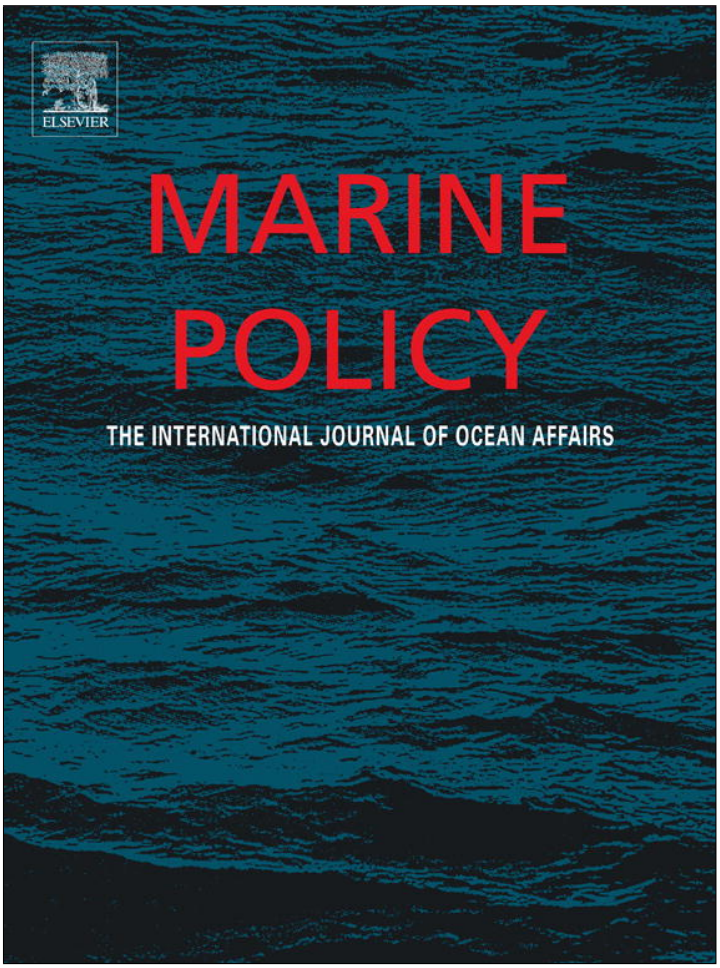

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Rio+20 and the reform of the Common Fisheries Policy in Europe

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ABSTRACT

At the Rio+20 meeting in June 2012, governments of the world committed to rebuilding fish stock sizes by 2015 at least to levels that can produce the maximum sustainable yield (MSY), even if that would require the temporary closure of fisheries. This study explores the outcomes of such action for European stocks. In 2012, only 8 of 48 stocks (17%) were abundant enough to produce MSY and with a business as usual scenario, this number would not increase by 2015. In contrast, if fishing was reduced to levels consistent with rebuilding and if some fisheries were temporarily closed, 50–70% of the examined stocks would be able to reach the Rio+20 target by the end of 2015. In this scenario, after three years with reduced catches, fish supply from European stocks would reach and exceed the levels of 2011 already in 2016. The implications for fish, fishers and fish consumers are discussed.

1. Introduction

As an outcome of their meeting in Rio de Janeiro in June 2012, the governments of the World agreed on a document entitled "The Future That We Want" [1]. The meeting and this document have been widely criticized as being lacking in ambition and accountable goals [2]. However, Article 168 of the document, referring to fisheries, is surprisingly clear:

"We commit to intensify our efforts to meet the 2015 target as agreed to in the Johannesburg Plan of Implementation to maintain or restore stocks to levels that can produce maximum sustainable yield on an urgent basis. In this regard we further commit to urgently take the measures necessary to maintain or restore all stocks at least to levels that can produce the maximum sustainable yield, with the aim of achieving these goals in the shortest time feasible, as determined by their biological characteristics. To achieve this we commit to urgently develop and implement science-based management plans, including by reducing or suspending fishing catch and effort commensurate with the status of the stock."

The European Union and its member states as well as Iceland, Norway and Russia have subscribed to this political commitment. The commitment is clearly more ambitious than the proposal for the reform of the Common Fisheries Policy (CFP) presented by the European Commission in July 2011 [3], which is somewhat ambiguous in its wording about rebuilding of stocks, and is interpreted by the Commission as a commitment "to phase out overfishing by 2015" [4]. Phasing out overfishing by 2015 means that fishing mortality is reduced to a level that allows the future rebuilding of stocks to MSY-levels, sometime after 2015 and thus not in line with Rio+20. The Commission proposal has meanwhile been further weakened by a 'General Approach' [5] compromise of the agriculture and fisheries ministers in the Council of the European Union, who will craft the CFP reform together with the European Parliament. This 'General Approach' suggests postponing the phasing out of overfishing until 2020 for all stocks lacking respective reference points, which is currently the case for the majority of the stocks. It is thus in direct conflict with Rio+20, which is the latest official declaration of political will towards the reform of fisheries. This study explores the feasibility of the Rio+20 commitments given the current status of European fish stocks: How many stocks are already at or above the required MSY-level in stock size? How many stocks can reach MSY-level by the end of 2015? How many fisheries need to be closed? What will be the impact for fish supply in Europe?

2. Material and methods

This study used biomass estimates for 2012 and fishing mortality and landings for 2011 (the latest available) as provided in recent ICES advice documents available at www.ices.dk. ICES provided estimates of the fishing mortality reference point F_{msy} only for a subset of the stocks. ICES did not provide estimates of the spawning stock biomass reference point B_{msy}. We therefore used the F_{msy} and B_{msy} estimates by Froese & Proelss [6]. These estimates have been confirmed recently by another study [7]. Also, as can be seen in the in the data file (see below), the estimates of F_{msy} by Froese & Proelss [6] usually include the F_{msy}

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estimates of ICES within their confidence limits, i.e., these estimates are not significantly different.

We used the following equation for calculating the duration for reaching B_{msy} without fishing:

$$\Delta t = \frac{\ln\left(\frac{2B_{msy}}{B} - 1\right)}{2F_{msy}} \quad (1)$$

where Δt is the time in years required to reach B_{msy}, and F_{msy} is the fishing mortality that would eventually result in B_{msy}. For stocks that needed less than 3 years to reach B_{msy}, F during the transition phase was calculated from

$$F = \frac{1}{6}\left(6F_{msy} - \ln\left(\frac{2B_{msy}}{B} - 1\right)\right) \quad (2)$$

Potential landings in 2015 were calculated by multiplying the fishing mortality in 2015 with B_{msy}. Potential landings in 2016 were calculated by multiplying F_{msy} with B_{msy} for all stocks which had recovered to B_{msy}. Note that these estimates of potential landings only include adult fish. A spreadsheet with all data and sources is available for download at http://www.fishbase.de/rfroese/BmsyTime4.xls.

3. Results

Depending on assumptions about productivity, 50–70% of the stocks examined could be rebuilt to levels consistent with the production of MSY by 2015 if fishing is reduced to levels consistent with rebuilding (including some fishery closures). Rebuilding times could be estimated for 48 European stocks with suitable data [www.ices.dk, 6]. In 12 stocks (25%) overfishing had already ended in 2011 and 8 stocks (17%) were already at or above the MSY-level in stock size in 2012. An additional 26 stocks (54%) could reach that level by the end of 2015 if fishing was reduced in 17 stocks (35%) and suspended in 9 stocks (19%). The biology and current level of depletion of 14 stocks (29%) would not allow them to recover by 2015.

Note that for these results average productivity of the stocks was assumed. This productivity is most strongly influenced by recruitment, i.e., successful reproduction leading to high numbers of young fish joining the exploited part of the stock. However, many European stocks are so strongly depleted that recruitment has fallen below the long-term average. For these stocks, the assumption of average productivity may be unrealistic and thus they may need longer to rebuild to MSY-level stock sizes. A widely accepted reference point below which reproductive capacity may be compromised is half of the MSY-level stock size [8]. If stocks below this threshold will indeed have lower-than-average productivity, than a further 11 stocks will not be able to recover by 2015, i.e., only 50% of the stocks would reach the Rio+20 goal.

Landings from the 48 stocks examined stood at about 5.6 million tonnes in 2011. Closures and reductions in catches under the average-productivity scenario would reduce landings in 2015 to about 2.7 million tonnes. However, since fishing could be resumed on several fully recovered stocks in 2016, landings in that year would already exceed current landings with about 5.9 million tonnes and would continue to grow thereafter. Note that in our calculations we assumed that these future landings would consist only of adult fish. In contrast, a considerable fraction of the landings in 2011 consisted of juvenile fish, i.e., fish that were caught before they had a chance to reproduce and to reach their optimum harvest size [9]. Rebuilding stocks toward a healthy size and age structure is one of the binding requirements under EC law [10]. Reducing catch of juveniles should increase the productivity of stocks, improving prospects for rebuilding and increased yields and value.

4. Discussion

While decreasing catches and restoring fish stocks to MSY levels would result in a temporary drop of landings (50%), increased yield from rebuilt stocks will pay economically [11–13] even within the short time span considered here, as can be seen from the higher catches of larger and thus more valuable fish in 2016. The benefits of reduced fishing or even a temporary closure typically outweigh by far the cost incurred, as was recently shown for the example of North Sea cod (*Gadus morhua*) [14]. In another study of 13 European fish stocks (including North Sea cod), the profitability of catch reductions has been quantified by their shadow interest rate [13]. This newly proposed measure quantifies what interest, in terms of higher future fishing income, could be earned by reducing current catches and fishing incomes. The shadow interest rates for the 13 European stocks are between 10 and over 200 percent per year, indicating that temporarily reducing catches will earn rates of return far beyond market interest rates.

But how would European consumers of fish be affected by temporary reductions of catches? With catch reductions, less fish are supplied to the markets and thus prices will increase. The effect of increasing prices is weakened, however, as consumers will buy fish from other stocks [15]. Experience shows that price increases may actually not be too severe: Three stocks which have recovered in recent years are North Sea herring (*Clupea harengus*), North Sea plaice (*Pleuronectes platessa*), and Eastern Baltic cod (*Gadus morhua*). The corresponding temporary catch reductions have not caused prices of herring, plaice, or cod to increase significantly on European fish markets [16]. It should be noted, however, that the catch reductions considered here are much larger. They could be offset in part by utilizing larger portions of the catch of, e.g., sprat (*Sprattus sprattus*), herring (*Clupea harengus*), blue whiting (*Micromesistius poutassou*) and Norway pout (*Trisopterus esmarkii*) for human consumption rather than for animal feed [17]. After the period of stock rebuilding, fish supply to European consumers will increase [8] (this is the very concept of MSY), and therefore prices will tend to decrease. Thus, after a relatively short period of stock rebuilding, European fish consumers are likely to be better off than they currently are.

While overall fishing incomes will be higher and consumers of fish will benefit from larger and more productive stock sizes, not everybody will benefit from stock rebuilding. Employment in fisheries will have to be reduced during the rebuilding period. Also after this phase, less effort will be needed to catch the fish, as fishing is more efficient at larger stock sizes. Sustainable fisheries thus do not only require setting strict total allowable catches, but also facilitation of a 'decent exit' of some fishers from the trade.

In summary, if fishing is reduced to levels consistent with fast stock rebuilding (including temporary closure of some fisheries), 50% to 70% of European stocks would be able to rebuild in size to the level that can produce the maximum sustainable yield by the end of 2015, as required by the political commitments made by European countries in Rio+20 [1]. Such a transition will not be a loss but an overall economic gain, as temporary catch reductions are more than offset by higher future catches [11,13,14]. Fish supply in Europe, which consists of 62% of imported fish [18], would not be interrupted, and supply from European waters would reach and exceed current levels already from 2016 onward. Thus, all that is needed to fulfill international obligations and truly reform European fisheries, is for European politicians to do what they have committed to do. In contrast, with business as usual, only 8 stocks (17%) will fulfill the Rio+20 commitment in

2015–and European fish stocks will continue to produce far less yield and value than they are capable of, underperforming as national and international assets.

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References

[1] UN. The future that we want. Outcome of the United Nations Conference on Sustainable Development. Rio de Janeiro, Brazil; 20–22 June 2012. 〈http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N12/381/64/PDF/N1238164.pdf?OpenElement〉 [accessed 20.07.12].

[2] Suresh V, Tanvi NS. Rio+20: recipe for disaster? Deccan Chronicle; 18 July 2012, 2012. 〈http://www.deccanchronicle.com/editorial/op-ed/rio20-recipe-disaster-416〉 [accessed 20.07.12].

[3] EU. Proposal of the European Commission for a Regulation of the European Parliament and of the Council on the Common Fisheries Policy. COM(2011) 425 final; 2011.

[4] EU. Communication from the Commission concerning a consultation of fishing opportunities. COM(2011) 298 of 25 May 2011. 〈http://ec.europa.eu/fisheries/partners/consultations/fishing_opportunities/consultation_document_en.pdf〉 [accessed 20.07.12].

[5] Council of the European Union. Proposal for a regulation of the European Parliament and of the Council on the Common Fisheries Policy—General approach. Interinstitutional File 2011/0195(COD), PECHE 227, CODEC 1657. Brussels; 14 June 2012. 〈http://register.consilium.europa.eu/pdf/en/12/st11/st11322.en12.pdf〉 [accessed 20.07.12].

[6] Froese R, Proelss A. Rebuilding fish stocks no later than 2015: will Europe meet the deadline? Fish and Fisheries 2010;11:194–202.

[7] Martell S, Froese R. A simple method for estimating MSY from catch and resilience. Fish and Fisheries 2012. http://dx.doi.org/10.1111/j.1467-2979.2012.00485.x.

[8] Froese R, Branch TA, Proelss A, Quaas M, Sainsbury K, Zimmermann C. Generic harvest control rules for European fisheries. Fish and Fisheries 2011;12:340–351.

[9] Froese R, Stern-Pirlot A, Winker H, Gascuel D. Size matters: how single-species management can contribute to ecosystem-based fisheries management. Fisheries Research 2008;92:231–241.

[10] MSFD. Marine strategy framework directive. Official Journal of the European Union 2008;L 164/19. 〈http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:164:0019:0040:EN:PDF〉 [accessed 20.07.12].

[11] Döring R, Egelkraut T. Investing in natural capital as management strategy in fisheries—the case of the Baltic Sea cod fishery. Ecological Economics 2008;64:634–642.

[12] Sparholt H, Bertelsen M, Lassen H. A meta-analysis of the status of ICES fish stocks during the past half century. ICES Journal of Marine Science 2007;64:707–713.

[13] Quaas MF, Froese R, Herwartz H, Requate T, Schmidt JO, Voss R. Fishing industry borrows from natural capital at high shadow interest rates. Ecological Economics 2012;82:45–52.

[14] Froese R, Quaas M. Mismanagement of the North Sea cod by the Council of the European Union. Ocean and Coastal Management 2012. http://dx.doi.org/10.1016/j.ocecoaman.2012.04.005.

[15] Quaas MF, Requate T. Sushi or fish fingers? Seafood diversity, collapsing fish stocks, and multi-species fishery management. Scandinavian Journal of Economics, 〈http://econstor.eu/bitstream/10419/55826/1/687787769.pdf〉, in press.

[16] STECF. The 2011 Annual Economic Report on the European Fishing Fleet, STECF-11-16. Anderson J, Guillen J, Virtanen J, editors. Joint Research Centre, Ispra; 2011.

[17] EP 2004. The fish meal and fish oil industry: its role in the Common Fisheries Policy. Fisheries Series, Fish 113, EN; 2004. 〈www.consult-poseidon.com/reports/EP Role of Fish Oil-Meal in the cfp.pdf〉 [accessed 20.07.12].

[18] AIPCE-CEP. Finfish study 2011. EU Fish Processors and Traders Association, Brussels; 2011.