

CTEEA/S5/20/FR/012

**CULTURE, TOURISM, EUROPE AND EXTERNAL AFFAIRS COMMITTEE****INQUIRY ON THE NEGOTIATION OF THE FUTURE RELATIONSHIP BETWEEN THE EUROPEAN UNION AND THE UK GOVERNMENT****SUBMISSION FROM PROFESSOR MICHAEL HEATH<sup>1</sup>, DR ROBIN COOK<sup>1</sup> AND PROFESSOR PAUL FERNANDES<sup>2</sup>**<sup>1</sup> University of Strathclyde, Department of Mathematics and Statistics<sup>2</sup> University of Aberdeen, School of Biological Sciences**What is the key outcome from the negotiations that would best secure the sustainability of fisheries?**

- It is essential to reach an agreement on quota-allocation and access to waters which allows all the coastal states to proceed with fully cooperative management of their shared fish resources.

There is a general perception that the Common Fisheries Policy has led to large scale declines in fish stocks due to over-exploitation. However, this is incorrect. Our analysis of over 100 years of data from European fisheries [1] shows that the damage to fish stocks occurred between the end of World War II and around 1970. During this period there were few effective measures to regulate international fisheries and most governments subsidised fleet expansion. A very large escalation of catching occurred that lead inexorably to stock depletion. By the 1980s, it became impossible to sustain the level of catches. This failure of management was inherited by the CFP at its formation in 1983. It took many years to rein in the levels of fishing activity during the 1980's and 1990's requiring difficult contractions of the industry and reduction in exploitation through effort controls and catch limits, based on extensive scientific assessments [2]. Finally, by the early 2010s, the evidence shows that most stocks, at least in northern European waters, are meeting internationally recognised sustainability criteria [2,3]. A key element of the CFP is that for the first time in Europe it provided legally enforceable regulations with sanctions which ultimately proved instrumental in reducing over-exploitation. Any new agreement must include comparable instruments.

In general, the UK does not dispute the overall level of Total Allowable Catches (TAC) for shared stocks, upon which the annual catching opportunities within the CFP are based. The annual TAC for each species is based on consensus scientific advice from the International Council for the Exploration of the Sea (ICES). However, the UK now disagrees with the way in which the TACs are shared between member states. The current formula for this 'quota-sharing' is referred to as Relative Stability, and was based largely on historical landings during a period prior to formation of the CFP. However, due to changing markets, fleets and distributions of fish, this has led to restricted opportunities for UK vessels to exploit stocks in UK waters. This in turn has led to excessive discarding of some species such as hake and saithe as vessels are forced to remain within catch limits for each individual species in mixed fisheries.

Relative Stability, while providing a basis for sharing in the past, has clearly outlived its utility.

The draft Fisheries Framework Agreement released by the UK Government on 19 May [4] concentrates on the issues of mutual access to national waters for fishing and re-alignment of Relative Stability, but makes relatively little reference to the imperative to ensure the sustainability of fish stocks.

The problem is that Articles 2 and 4 of the draft imply that the UK will not cooperate on the sustainable management of fish stocks unless its demand for a readjustment of quota-sharing is met. Article 2 leaves the UK with the option to set-aside the independent scientific advice from ICES in favour of “socio-economic aspects and other relevant factors”. Article 4 allows for the UK to manage its own fisheries independently according to its own perception of sustainability criteria.

Given the current positions of the Parties, an agreement which enables constructive cooperation to ensure sustainability of stocks will require both sides to compromise. On the one hand, the UK will need to relax its demand for, apparently, a step-change in quota-share arrangements from Relative Stability to new allocations reflecting zonal attachment. This would be cripplingly difficult for some other member states to absorb. On the other hand, the EU will need to recognise that Relative Stability is no longer an equitable and productive mechanism for quota-sharing. Both sides need to agree on an incremental migration from Relative Stability to a new quota sharing arrangement which better reflects the distribution of fish between UK and EU EEZs. Without such an agreement, the UK's Draft Framework Agreement clearly threatens unilateral actions on fisheries management. Our research [1,5] shows that this would pose a threat to the sustainability of fish stocks.

### **What would be the impact of no agreement on fisheries between the UK and the EU?**

- Our view on this question is restricted to the consequences for the long term viability of the fish stocks and their associated ecosystems. – Failure to agree would open the way to unilateral action on both sides which our research in the North Sea shows would threaten both elements.

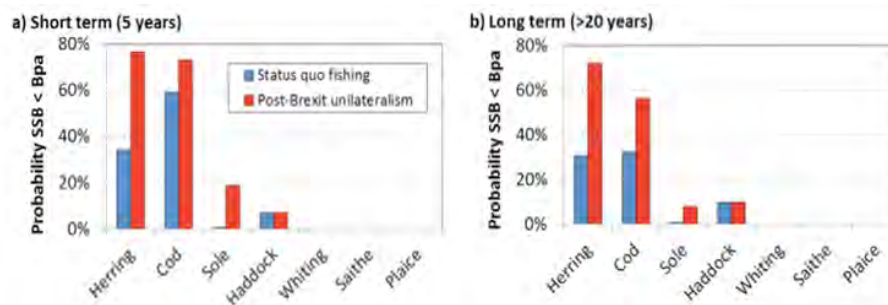
The United Nations Convention on the Law of the Sea (UNCLOS) requires coastal states to cooperate in the management of shared fish stocks. However, it does not prevent states from unilaterally setting catch limits in their own EEZ if no agreement is reached - provided these are consistent with ensuring that stocks as a whole are protected from overexploitation.

The UK no longer accepts the share of resources assigned by the EU. If the UK were to set catch limits within its waters based on ‘zonal attachment’ [6,7] and exclude EU vessels from fishing there, while the EU states maintain their right to catch their existing Relative Stability share but from their own waters, then stocks would face being over exploited. There is a clear precedent for this in disputes between states involved in the North East Atlantic mackerel and blue whiting fisheries. It is argued that

the UK has the upper hand in the negotiations because EU states would not be able to catch their Relative Stability quota-share without access to UK waters. However, our research suggests that this is not necessarily the case, though it is clear that the profitability of doing so would be lower [1].

We have conducted an assessment of plausible narratives for unilateral quota-setting in the North Sea by the EU and Norway on the one hand, and the UK on the other, based on provisional zonal attachment estimates for each of the shared fish stocks [1,5]. The narratives indicate a 4-fold increase in UK expectations for North Sea herring catch, 3-fold for saithe and sole, and smaller expectations for other species. These translate into a 70% increase in overall international herring catch over and above the recommended TAC, and a 60% increase in pelagic trawling activity. Corresponding increases in international catches of demersal fish (cod, haddock, whiting) and demersal trawling activity of up to 10% are anticipated.

Two completely different mathematical models were used to simulate the consequences of the narratives for fish stocks and the marine food web. The first calculated the probability of spawning stock biomass for seven key stocks (herring, cod, haddock, whiting, saithe, plaice, sole) falling below the precautionary reference level (referred to as 'Bpa') following the onset of unilateralism (Fig. 1). Stock biomass falling below Bpa is a warning signal which triggers the ICES to recommend reductions in fishing in order to conserve the stock.



**Figure 1. Percentage probabilities of spawning stock biomass (SSB) of key species in the North Sea falling below their respective precautionary levels of biomass (Bpa). Blue bars indicate the probabilities assuming that status quo fishing conditions in 2017 continue unchanged into the future. Red bars indicate the probabilities under the unilateralism scenario.**

The second model simulated the whole food web in the North Sea, from bacteria to whales, but as aggregated groups of similar types of microbes, plants and animals rather than as individual species.

The two modelling approaches produced convergent conclusions on the likely risks associated with unilateralism. They both showed that the greatest risk is to stocks of plankton-eating “pelagic” fish, especially herring. Risks to demersal fish as a whole are smaller, but within this group there is a significant risk to cod stocks. Among the indirect consequences of unilateralism are declines in cetaceans (whales, dolphins and porpoises) and seabirds as a combined consequence of reductions in their main food supply (pelagic fish) and increased mortality due to by-catch in fishing gears.

**What is your view on the usefulness of zonal attachment as a principle for dividing fishing opportunities, especially for Scottish fisheries?**

- Relative Stability provided an agreed framework to share resources but has outlived its usefulness. Zonal attachment is a rational alternative for sharing of TACs between fishing nations but still requires an agreed interpretation by both parties.

There are two aspects to the case for zonal attachment [6,7] as opposed to Relative Stability – equity and conservation. The equity case arises from the open-access principle at the heart of the CFP. This is that vessels from member states are free to fish anywhere in EU waters provided they have a legal quota for the stock and respect limitations defined by distance from the coast. In some cases this has led to large proportions of the international catch being taken from one member states' waters. Key examples are sandeel and herring in the North Sea where the majority is taken from UK waters [1,5,6,7], and mackerel and blue whiting in the NE Atlantic. The equity issue arises because for all these species the UK has a much smaller proportion of the TAC under Relative Stability than the proportion of total catch taken in the UK EEZ, or the proportion of stock in the UK EEZ or, for the migratory species, the proportion of time that fish spend in the UK EEZ. As the UK leaves the EU this becomes an acute issue of equity.

The conservation issue arises in mixed species fisheries, such as operate in NW Europe, because the inflexibility of Relative Stability means that changes in fish distribution and species composition, e.g. due to climate change or stock recovery, lead to mis-matches between catch composition and quota composition for individual fleets. This creates a situation whereby vessels are frequently faced with over-quota catches of some species and within-quota catches of others, forcing them to discard the so-called 'choke species' for which their quota is exhausted. Examples are hake in the North Sea and west of Scotland [8].

The concept of zonal attachment offers solutions to these equity and conservation problems, but there is no universally agreed definition of how to estimate it. We recently published a scientific article [7] with a considered mathematical definition and applied it to several key stocks of interest to Scotland. Given adequate empirical data, this accounts for the potential for different life stages to occur in different areas, and for migrating fish. To our knowledge, this is the only scientifically peer reviewed definition of zonal attachment based on, and applied to, empirical data. There is nonetheless, likely to be a protracted negotiation over a mutually acceptable definition. Also the frequency with which quota-shares should be re-aligned in accordance with shifting zonal attachment is controversial, since estimation of zonal attachment from survey data carries error and uncertainty so some form of average estimate over time would be appropriate. We suggested [7] a five-year time period in keeping with periodic reviews of fishery management plans in the EU. We also suggested, as was the case when the concept was introduced between the USA and Canada, that a gradual transition could take place, whereby quota-shares migrate towards zonal attachment in 10% increments over several years. It would also be sensible to

prioritise the “choke species” such as hake. This should be politically more justifiable considering the fact that certain member states did not even take their quota: in 2018 for example, Spain was allocated 31,499 t of Northern hake quota, but only caught 26,078 t; France was allocated 58,274 t and caught 41,260 t; yet the UK, which was only allocated 1% of the hake TAC in the North Sea, regularly discards thousands of tonnes of hake [8].

[1] Heath, M.R. & Cook, R.M. 2020. Risks to North Sea fish stocks and wildlife if post-Brexit fishery negotiations fail to reach agreement on quotas and access to UK waters: EXTENDED TECHNICAL REPORT. University of Strathclyde, March 2020. 136pp. <https://doi.org/10.17868/71708>

[2] Fernandes, P.G. & Cook, R.M. 2013. Reversal of fish stock decline in the Northeast Atlantic. *Current Biology* **23**, 1432-1437. <https://www.sciencedirect.com/science/article/pii/S0960982213007070>

[3] Fernandes, P.G., Ralph, G.M., Nieto, A. *et al.* 2017. Coherent assessments of Europe’s marine fishes show regional divergence and megafauna loss. *Nature Ecology and Evolution* **1**: 0170, 1-9. <https://www.nature.com/articles/s41559-017-0170?proof=trueNov>

[4] Draft UK Negotiating Document. Title: Draft working text for a framework agreement between the United Kingdom of Great Britain and Northern Ireland and the European Union. [https://www.gov.uk/government/publications/our-approach-to-the-future-relationship-with-the-eu?utm\\_source=987e7f2a-ddf3-41ef-bb3c-d06b80493019&utm\\_medium=email&utm\\_campaign=qovuk-notifications&utm\\_content=immediate](https://www.gov.uk/government/publications/our-approach-to-the-future-relationship-with-the-eu?utm_source=987e7f2a-ddf3-41ef-bb3c-d06b80493019&utm_medium=email&utm_campaign=qovuk-notifications&utm_content=immediate)

[5] Heath, M.R. & Cook, R.M. 2020. Risks to North Sea fish stocks and wildlife if post-Brexit fishery negotiations fail to reach agreement on quotas and access to UK waters: SUMMARY REPORT. University of Strathclyde, March 2020. 23pp. <https://doi.org/10.17868/71709>

[6] University of Aberdeen 2017. The spatial distribution of commercial fish stocks of interest to Scotland in UK waters. Report prepared for the Scottish Fishermen’s Federation, January 2017. 30pp. [https://www.sff.co.uk/wp-content/uploads/2017/03/SFF\\_Report\\_v8-1.pdf](https://www.sff.co.uk/wp-content/uploads/2017/03/SFF_Report_v8-1.pdf)

[7] Fernandes, P.G. & Fallon, N.G. 2020. Fish distributions reveal discrepancies between zonal attachment and quota allocations. *Conservation Letters*. 2020;e12702. <https://doi.org/10.1111/conl.12702>

[8] Baudron, A.R. & Fernandes, P.G. 2015. Adverse consequences of stock recovery: European hake, a new “choke” species under a discard ban? *Fish and Fisheries* **16**, 563-575. <https://onlinelibrary.wiley.com/doi/abs/10.1111/faf.12079>