UK FISHING IN A CHANGING CLIMATE

POLICY BRIEF NO. 8 - DECEMBER 2020

OVERVIEW

- Climate change is already affecting the UK fishing industry, and is projected to affect it further in the future.
- Fish stock distributions and life cycles are changing in response to warming ocean temperatures, leading to changes in the UK fleet's fishing patterns.
- Climate change is leading to stronger and more frequent storms at sea, which has implications for the safety, efficiency, and financial resilience of fishing.
- To prepare for the future, there needs to be a greater understanding of the effects of climate change on the fishing industry. This requires collaboration between scientists and fishermen on data gathering and predicting future trends.
- Adapting to the effects of climate change can be addressed through a range of measures, such as flexible stock management systems, extra focus on fishing safety, and strong inter-sector communication.

BACKGROUND

Climate change is having a profound impact on the UK's fisheries and weather systems, which leads to significant challenges for the fishing industry. The fleet needs to be able to adapt swiftly to these changes, which requires constructive input from industry, policy and research.

CHANGES TO FISH STOCKS

Over 70% of common commercially important fish species found on the European continental shelf have seen changes in abundance or distribution in response to climate change (1), and further changes are expected. Many species have shifted their distributions northwards, eastwards, and/or into deeper waters in response to warming ocean temperatures. This is especially apparent in the North Sea, where waters are warming at a faster rate than the global average (2).

This briefing summarises the output from the APPG on Fisheries open Parliamentary webinar, 4 November 2020. The meeting brought together a diverse array of stakeholders from across the UK. This document is a synthesis of the discussions that took place both at the event and online (via #FishingClimateChange).

Some species are expected to decrease in abundance within UK waters, such as cod, herring and halibut, but others, such as squid, sardine, seabass and John dory, are expected to increase as they move northwards from more southern latitudes (3). Such shifts are already having an effect; for instance, trawlers off of northeast Scotland are increasingly trawling for squid rather than traditional species such as cod and halibut (4).

Other aspects of stock behaviour have also changed. For instance, cod in the North and Irish Seas have spawned several weeks earlier every decade in recent years (5). This has knock-on consequences if prey patterns do not follow suit, meaning that young fish are less likely to make it to adulthood. These trends may lead to diminished recruitment in important commercial stocks.

Such changes have significant implications for stock management. Many current quota systems follow the Relative Stability principle, which allocates quota shares according to historical data. This allocation approach hinders adaptation as it relies upon data that are becoming increasingly irrelevant as stock distributions shift (4, 6, 7). This could mean declining stocks may become over-exploited, whilst incoming stocks are under-exploited or are discarded as bycatch if quota is insufficient (7). For instance, bluefin tuna is becoming increasingly prevalent in Cornish waters, but UK vessels fishing there currently have zero quota for the species (8, 9).

CHANGES IN WEATHER PATTERNS

Future projections of storminess are uncertain, but models suggest more frequent and stronger storms are on the horizon for the UK (10). This means that fleets may spend more time tied up and unable to fish, vessels and port infrastructure may be damaged, and fishing safety could be compromised (11, 12). The combination of increased storminess along with changing stocks could lead to fishermen having to fish further out and in poorer conditions in order to reach a sufficient catch (12), leading to further risks to their safety. Vessels have also reported changes in tides and currents, and have had to adapt fishing patterns accordingly (8).

As well as safety, this also has consequences for financial resilience. Fishing incomes are already uncertain given fluctuations in catches, especially for the small-scale fleet (13), and this is likely to be exacerbated as weather patterns become more extreme (4). This was demonstrated in the exceptionally stormy winter of 2013/14, which had a strong negative impact on fishing incomes (14).

SHIFTING STOCKS: A WHITBY CASE STUDY

Whitby is a coastal town in Yorkshire that has seen major declines in its fishing industry in recent decades. Stocks of cod, haddock and whiting off Whitby's coast were diminishing by the 1990s, leading to the fleet becoming less and less viable. The fleet was reduced to better match the existing stock levels, but stocks continued to decline. At the time, there was uncertainty over why catches were poor. It is now thought that climate change was (and continues to be) a major contributing factor (8, 15).

Fishing patterns shifted northwards to follow the stocks, with many vessels choosing to land their catch in the more northern port of Aberdeen rather than Whitby. Fishing communities in Whitby declined, surrounding infrastructure and markets collapsed, and restaurants began switching to non-local suppliers to provide frozen fish (8). Nowadays the fishing grounds for these stocks are focused around Shetland, and it is likely that regime shift will continue in these northern waters too (16).

THE ROLE OF FISHERMEN IN DATA COLLECTION

The fishing industry can contribute to scientific understanding both through pre-existing data that has historically been under-utilised, and through actively collaborating with scientists to gather data for specific research purposes. Given the number of vessels in operation and the amount of time spent at sea, fishermen often have access to much more comprehensive information than is available through scientific research alone. Not only is this information useful for recording and predicting the effects of climate change, the act of sharing and forming constructive conclusions also enhances trust and collaboration between industry and scientists (17).

Pre-existing data

A wealth of useful data already exists, collected by fishermen as part of their normal practices, such as within vessel logbooks (18). For instance, long-term datasets from the demersal fleet have been very instructive in detecting subtle changes to stock behaviour, such as cod spawnings (5), which helps to develop models that predict how stock patterns will change in future years.

Catch data recorded as part of fishing policy can be very informative. For instance, commercial catch per unit effort data can track how landing patterns have changed over time, thereby acting as a proxy for changes in stock distributions. These data have demonstrated that cod stocks in the North Sea have moved northwards and into deeper waters in recent years (19). It is argued that fishing intensity needs to be reduced to address this and avoid accelerating the decline of these stocks (20).

Active collaboration

Fishermen are also increasingly being trained to record data for specific scientific purposes (21, 22). As well as fishermen onboard vessels, staff in seafood processing facilities and factories are also being trained to collect data alongside quality control procedures. Some physiological characteristics of fish, for instance fat content, can be used as bioindicators of climate change impacts (23).

Novel collaborative partnerships have formed that recognise the importance of industry involvement. Since 2018, the Scottish pelagic fleet has begun a pelagic self-sampling programme, led by the Scottish Pelagic Fishermen's Association, NAFC Marine Centre and Marine Scotland Science (24, 17). The programme involves development and installation of bespoke on-board technology as well as training crews in collecting quality scientific data (22). Ultimately, the aim is for Scottish pelagic fishers to provide accredited data and so support fisheries management decisions.

RESPONDING TO CLIMATE CHANGE

Although the UK fleet is generally aware that climate change will influence future fishing, some have identified a reluctance to act upon it (25). Industry reluctance has been suggested to be due to a number of factors, such as perception of climate change as a long-term issue, lack of funding, or a perception of overly rigid management and allocation (26, 27). Flexible decision-making within policy and legislation, as well as effective communication between stakeholders at every level, could help to engage fishermen on taking action on climate change.

There is an ongoing need for dialogue between government, academics and the fishing industry, to ensure that adaptation decisions are well-informed and that uncertainty about the future is reduced as far as possible (11, 27, 28). Since climate change is a complex and multi-faceted issue, it needs input from a range of scientific disciplines (such as biology, sociology and economics) (28) and from all levels of management (such as local authorities and national policymakers) (4) working with the fishing industry. Creating a harmonious collaborative structure between all of these parties will ensure that the decisions taken will be as constructive as possible.

Responses from legislation

Addressing climate change features as one of the eight headline objectives of the UK's new Fisheries Act. The Fisheries Act states that the industry should adapt to climate change while also minimising its own contributions to greenhouse gas emissions (29). How this objective can be achieved by devolved authorities when developing policies is not explicitly stated in the Act, but introducing flexibility in quota management schemes is frequently cited as a key method whereby the fleet could respond appropriately to changes in fish stocks (4, 27).

Following the principle of Zonal Attachment rather than Relative Stability has been proposed as a broad improvement to quota allocation at the international and national level. Since this principle relies on recent scientific data, it can account for recent shifts in stocks, whereas historical catch shares cannot. Fishing quotas would then be more closely aligned with what fishermen are able to effectively and sustainably catch, leading to potential economic and environmental benefits and fewer discards (7).

Responses concerning safety and wellbeing

It is recommended that the fleet undergoes a systematic review of its vulnerability to climate change to help determine the direction of future developments (4). Extra safety measures such as raised decks, utilisation of Personal Flotation Devices, and extra safety training would be beneficial (4). To build economic resilience within the fleet so that it can tolerate changes to fishing grounds or increasingly poor weather, measures such as establishing a financial 'safety net' and supportive insurance policies are viable solutions (13, 27).

Responses onshore

Onshore, there is a need to build port resilience, to assess potential transport pressure points, and even to consider how to facilitate smooth relocation of segments of the fleet or surrounding infrastructure as stock distributions continue to shift (4). Every stage of the supply chain will see changes, and these need to be foreseen and accounted for, through working closely within and between these sectors.

Marketing can support the fishing industry through communicating changes in local supply to consumers, and promote novel or under-utilised species (4), especially those that are projected to become more available in UK waters in coming years. The Seafish 'Love Seafood' campaign (30) is currently working to promote seafood consumption across the UK, including that of less frequently eaten species.

SUMMARY

There is a growing body of evidence that climate change is already affecting UK fishing, and that these effects are likely to become more profound. Anticipating these changes relies on robust scientific research, which itself relies on the active inclusion of the fishing industry. There is a need for fisheries management policy to respond to this evidence by becoming more flexible and open to adapting to significant and sometimes unpredictable changes in stock dynamics.

All of these necessary efforts are already underway in the UK, which provides a promising foundation for future efforts. Segments of both the demersal and pelagic fleets are working closely with academics to gather data, and these results are being communicated to policymakers to help inform fisheries management decisions. The relatively loose framework of the new Fisheries Act allows fisheries authorities to take adaptive management measures that account for changing stocks and conditions. Fine-tuning new management techniques at the regional level, and building resilience within every segment of the sector, will be an ongoing task that requires structures be put in place to ensure effective communication and collaboration between all involved parties.

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