Delivering world leading fisheries management in the UK

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Introduction

This document sets out The Pew Trusts' recommendations on principles that would enable the UK to end overfishing and achieve its stated aim of implementing "world leading" fisheries management after the UK leaves the European Union.

These ambitious recommendations are informed by international best practice and reflect the potential of fisheries in the UK and overseas territories' Exclusive Economic Zones (EEZs), and of fishing by UK vessels in international waters. Implementing the recommendations would place the UK among leading actors on the world stage and underpin a thriving fishing industry that delivers increased economic, social and environmental benefits.

The document identifies nine principles, recommended policy measures required to implement them, and a short list of justifications for each measure.

Fisheries Management Principles

Principle 1: A legal requirement to set catch limits that put an immediate and lasting end to overfishing.

Required policy measures:

1. Create domestic legislation that stipulates a limit on fishing of all harvested species in UK waters below the F_{MSY} reference point[1], developing proxies for data limited stocks, to ensure fishing mortality cannot exceed the level that would deliver Maximum Sustainable Yield (MSY).
2. Stipulate within this domestic legislation which institution is accountable for decisions on fishing opportunities.
3. Directly limit fishing mortality in all stocks through Total Allowable Catch (TAC)[2] limits and quotas, and measure fishing mortality against those limits.

[1] F_{MSY} is the maximum level of mortality caused by fishing that allows a population size to eventually reach or maintain MSY within a single stock, usually across a long time frame.
[2] The TAC is a catch limit set for a particular fishery, generally for a year or a fishing season. TACs are usually expressed in tonnes of live-weight equivalent, but are sometimes set in terms of numbers of fish.

4. Apply Harvest Control Rules (HCRs)[3] that automatically adjust fishing pressure in response to the latest information on stock recruitment, biomass and other important factors, using trigger reference points defined in advance.

Justification:

1. Setting fishing limits below F_{MSY} will:

    a. help to restore and maintain fish stock biomass above levels that can provide MSY in the long term;

    b. bring the UK into line with world leading fisheries management law such as the United States Magnuson-Stevens Fishery Conservation and Management Act (2007)[4] and deliver the UK's international legal obligation to meet Article 61(2) and 61(3) of the United Nations Convention on the Law of the Sea (UNCLOS)[5] and commitment to the United Nations Sustainable Development Goal (SDG) 14[6];

    c. reduce the time it takes to realise the significant social, economic and environmental benefits of restoring stocks above biomass levels capable of producing MSY. The UK's Natural Capital Committee estimated in its second State of Natural Capital that if stock levels in UK waters were returned through better management to averages that existed between 1938-1970, the value of landings could potentially be increased by £1.4bn per annum (Natural Capital Committee, 2014). A recent assessment suggests that the EU fishing fleet could gain an extra €4.54 billion operating profit per year if all fish stocks in the north-east Atlantic were exploited at levels that produce MSY (Guillen et al., 2016). The World Bank Group's 'Sunken Billions' report estimate that currently more than $12 billion is lost as a result of unsustainable levels of fishing in European waters, including the Mediterranean (World Bank Group, 2017); and

    d. increase the resilience of fish stocks in response to environmental changes, such as changing sea temperatures, thereby improving the stability of catches and reducing the risks associated with overfishing or natural ecosystem fluctuations in the complex mixed fisheries that are prevalent in UK waters.

2. Stipulating which UK institution's decision makers are accountable when setting fishing opportunities in domestic legislation will establish clear lines of responsibility, enable

[3] HCRs are a set of well-defined pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points.
[4] Magnuson-Stevens Fishery Conservation and Management Act, 2007
[5] United Nations Convention on the Law of the Sea, 1982
[6] Sustainability Development Goals, 2015

judicial review, and help ensure fisheries management decisions are made for the benefit of wider society.

3. Setting TACs and quotas to limit catches to achieve sustainable levels of fishing is an established scientific approach that has long been considered a cornerstone in fisheries management. Evidence from the UK, Europe and other international coastal states at the forefront of sustainable fisheries management demonstrates the multiple environmental, economic and social benefits of setting robust output controls (Nimmo, Cappell and Lowe, 2016) (Marchal et al., 2016).

4. Creating domestic legislation that requires managers to set sustainable TACs would bring the UK into line with world leading fisheries nations such as the United States, Australia and New Zealand. It would also align the UK with the approach taken by the European Union and Norway, enabling a consistent approach when agreeing fishing opportunities for shared and straddling fish stocks that are fished by UK and neighbouring coastal states.

5. HCRs have proven a critical tool in managing fisheries successfully around the world, ensuring that objectives are met in practice and avoiding a short term perspective (Kvamsdal et al., 2016).

Principle 2: Develop and maintain a full understanding of the condition of fish stocks.

Required policy measures:

1. Require regular assessment of stock biomass against MSY reference points (B_{MSY})[7] for all harvested stocks under UK or shared management. For data limited stocks, develop proxy approaches to assess progress towards B_{MSY}.

Justification:

1. An understanding of the condition of fish stocks is vital to inform management decisions and to assess whether management objectives are being met. Measuring stock biomass against a recognised reference point (B_{MSY}) will enable the consistent evaluation of stock

[7] B_{MSY} is the biomass that enables a fish stock to deliver the maximum sustainable yield. In theory, B_{MSY} is the population size at the point of maximum growth rate. The surplus biomass that is produced by the population at B_{MSY} is the maximum sustainable yield that can be harvested without reducing the population.

biomass; help track trends over time and enable the UK to assess whether SDG 14 commitments[8] are being achieved.

2. Introducing this policy measure will bring the UK into line with other world leading fishing nations. For example, the United States "National Standard 1—Optimum Yield"[9] requires fisheries management measures to take into account the biomass of exploited fish stocks when setting fisheries limits, and Australian fisheries managers are required to set fishery limits at a reference point greater than B_{MSY} with an overriding objective for long-term sustainability and profitability (Australian Department of Agriculture Fisheries and Forestry, 2007).

3. Setting fishing opportunities that increase the biomass of stocks to sustainable levels is proven to deliver social, economic and environmental benefits. For example, since the North Sea herring stock collapsed in the 1970s due to overfishing and low recruitment, fisheries managers have followed scientific advice to rebuild stock biomass levels. It has recovered to become one of Europe's most sustainable and profitable fisheries, with landings valued at €300 million per year. The large increases in catch per unit effort translate into a higher income for fishermen, with wages of pelagic crews among the highest in the European Union fishing industry (Nimmo, Cappell and Lowe, 2016).

Principle 3: Base management decisions on the best available scientific advice, peer reviewed and published, from established independent organisations.

Required policy measures:

1. Require fisheries management decisions to be based on the best available scientific advice from established independent organisations, such as the International Council for Exploration of the Sea (ICES).

2. Publish transparent and objective criteria that define best available scientific advice, including the stipulation that advice must be peer reviewed and available for free to the public before it is used to inform management decisions.

Justification:

1. As a signatory to UNCLOS the UK is subject to Article 61(2) and 61(5) that state that coastal states should take into account, '…the best scientific evidence available…' and

[8] United Nations Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
[9] National Standard 1 – Optimum Yield, National Oceanic and Atmospheric Administration.

that this information should be 'exchanged on a regular basis'. As identified in Principle 4, this is one of a number of international conventions that commit the UK to working individually and collaboratively to conserve living resources within its EEZ, neighbouring coastal states EEZs, and in international waters, even when evidence is lacking.

2. UNCLOS Articles 62 and 63 and the United Nations Fish Stocks Agreement (UNFSA)[10] create a duty on the UK to sustainably manage shared, straddling and highly migratory fish stocks with neighbouring coastal states. In fulfilling this obligation the UK will benefit from scientific advice that is at least equivalent in standard to the independent, internationally recognised advice used by neighbouring coastal states, to inform coherent fisheries management decisions.

3. To ensure transparency in the decision making process and a shared understanding among stakeholders of the criteria for advice used in decision making, it is important that decision-makers define what constitutes 'best available scientific advice'.

4. Advice must be independently peer reviewed by recognised marine experts to ensure methodologies used and conclusions reached are justified. To enable appropriate levels of public scrutiny and responses, advice must be published and available to the public at no cost in advance of management decisions being made.

Principle 4: Ensure the highest environmental standards are applied to fisheries management.

Required policy measures:

1. Create legislation that stipulates international legal obligations and best practice must be applied and implemented by the UK, including ecosystem-based management[11]; the precautionary approach[12]; cooperation in the management of shared, straddling and highly migratory fish stocks; and the targets listed under SDG 14.

Justification – the ecosystem-based approach:

[10] United Nations Fish Stocks Agreement, 2001

[11] The Marine Strategy Regulations (2010) state that an "ecosystem-based approach" (a) ensures that the collective pressure of human activities within the marine strategy area is kept within levels compatible with the achievement of good environmental status; and (b) does not compromise the capacity of marine ecosystems to respond to human-induced changes.

[12] UNFSA Article 6(2): States shall be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.

1. The UK is a signatory to the Convention on Biological Diversity (CBD)[13] and the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)[14] that require ecosystem-based management of marine resources. The UK Marine Strategy Regulations (2010), require the UK government and Devolved Administrations to apply an "ecosystem-based approach" when making decisions on activities undertaken in, or affecting, the UK's EEZ. United Nations General Assembly Resolution 71/123 goes further to set out international best practice in the application of the ecosystem based approach (United Nations General Assembly, 2016).

2. Recognising the potential impacts of fisheries on the wider marine environment, new legislation should include an explicit requirement for ecosystem-based fisheries management. Requiring all vessels fishing in UK waters to comply with marine species and habitat conservation measures, and introducing temporal and spatial measures to protect biologically sensitive areas, including areas supporting spawning and juvenile commercial fish species, will contribute to the conservation of living aquatic resources and marine ecosystems for the public good.

3. As the UK's neighbouring coastal states are also signatories to the CBD and OSPAR, UK governments should adopt a compatible definition of ecosystem-based fisheries management to enable complementary approaches to wider ecosystem management.

Justification - the precautionary approach:

1. For some stocks of UK interest there are insufficient data to enable F_{MSY} advice to be calculated. To avoid a situation where the lack of data leads to increased risk of overfishing, the precautionary approach should be applied when determining catch limits for these stocks.

2. As a signatory to UNFSA, the UK is required to apply the provisions of Article 6(2) when managing straddling and highly migratory fish stocks. Although not all stocks in the UK EEZ are straddling or highly migratory the precautionary approach should be applied to all data limited stocks that are harvested in UK waters.

Justification– shared, straddling and highly migratory fish stocks:

1. As a signatory to UNCLOS and UNFSA the UK has a duty to sustainably manage shared, straddling and highly migratory fish stocks with neighbouring coastal states. Recognising UK devolution arrangements, new domestic legislation must stipulate clear roles and

[13] Ecosystem Approach, Convention on Biological Diversity (2000).
[14] Ecosystem Approach, OSPAR (2003).

responsibilities in agreeing sustainable management and harvest control rules for shared, straddling and highly migratory stocks with relevant coastal states.

2. To ensure that the UK fulfils its domestic and international obligations harvest control rules and other management measures for shared, straddling and highly migratory stocks should be agreed with other coastal states through the adoption of regional fisheries management plans both for shared stocks within its EEZ and migratory stocks.

3. These plans must include provisions for setting fishing limits below F_{MSY} and clear processes that prevent overfishing arising from unilateral decision making.

Justification - UN Sustainability Development Goal 14:

1. SDG Goal 14 sets out ambitious marine targets that the UK and neighbouring coastal states have signed up to. To set the UK apart as a world leading manager of fisheries and the marine environment it could be one of the first countries to legislate for the steps necessary to achieve Goal 14.

2. By legislating to achieve SDG 14 in domestic law and fully implementing existing international commitments, UK governments would set clear targets that deliver the stated ambition of clean, healthy, safe, productive and biologically diverse seas which are vital in supporting thriving coastal communities and a profitable fishing industry.

Principle 5: Ensure that any management system introduced in UK waters provides the best possible control on fishing mortality

Required policy measures:

1. Implement direct output controls in order to limit fishing mortality, rather than effort-based management regimes, such as the 'days at sea'[15] approach.

Justification:

International experience has demonstrated the superiority of direct output controls as a basic pillar of fisheries management. Evidence from effort-based regimes highlights the shortcomings of 'days at sea' as a management approach to deliver sustainable fisheries for the following reasons:

[15] The 'days at sea' approach attempts to manage fishing mortality by limiting the total number of days or hours a vessel, or a defined group of vessels, are allowed to spend fishing in a given period (usually a year).

1. It is very difficult to accurately determine fishing mortality caused by each fishing vessel each day or hour and therefore the appropriate number of days each vessel should be allowed to fish each year. Even discrete fleets within a fishery are often characterised by considerable variations in their ability to catch fish (FAO, 1997). Add this to an incorrect assumption that there is a linear relationship between the amount of time spent fishing and the number of fish that will be caught; the allocation of 'days at sea' has regularly underestimated the associated fishing mortality.

   For example, when a 'days at sea' management approach was trialled in the UK in 2008 - 2009 it had to be terminated 9 months early because analysis of the first year's data confirmed that the catch levels for a number of species being landed was much higher than anticipated (Elson, Curtis and Edmonds, 2010).

2. Estimating the number of 'days at sea' that would achieve MSY requires constant adaptation to take account of technological developments such as increasingly efficient vessel design, engines and gear (Bollmann et al., 2010). As a result there are two fundamental risks associated with a typical effort quota management system: overfishing and overcapitalization (U.S. National Research Council, 1999).

   For example, to manage the risk of overfishing in the Pacific halibut fishery the length of the season reduced from 125 days in 1975 to less than three days in 1994 for a majority of the U.S. fishery (International Pacific Halibut Commission, 2006). In the New England groundfish fishery vessels allocations were reduced from 88 days in 1994 to 20 days in 2009 (Johnston and Sutinen, 2009).

3. When skippers only have a limited number of days at sea, it creates a perverse incentive to catch fish as quickly as possible during available days. Responsible fishermen who could otherwise take the time to fish in a safe, profitable and ecologically conscientious manner are induced to put aside these goals in an attempt to catch the most economically valuable fish as possible in the days available. As a result, they have little incentive to avoid overfished stocks and target healthier populations (Bollmann et al., 2010).

   The over-exploitation of cod by Faroese fleets provides an example of this (ICES, 2016). When the Faroese 'days at sea' system was designed, the fleet was expected to target the most abundant fish stock for efficiency reasons. However, since the value of cod is higher than that of other commercial species, individual fishermen are incentivised to catch as much cod as possible, despite its decreasing abundance relative to the other species, ensuring even more pressure on the cod stock (ICES, 2006).

4. Although effort-based regimes are often proposed as a way to reduce discarding of fish, the 'days at sea' approach is unlikely to end the practice of 'discarding', as it does not

deal with all the drivers of discarding. For example, it was estimated that less than 25% of discards in English fisheries between 2002 and 2010 were attributable to fishers' responses to quota restrictions (Catchpole et al, 2014). The remaining proportion of discards – more than 75% - were driven by other factors: fish being below the legal minimum landing size; fish for which there is no market and that do not have a minimum landing size; and fish for which there are inconsistencies in market and sorting practices.

5. Related to discarding, the 'days at sea' system does not address the 'choke species' issue either. Mixed fisheries will always be limited by the least abundant species as the UK will need to continue to protect the most sensitive and over-exploited stocks to deliver its international obligations. Therefore, even if a 'days at sea' approach were adopted, fishing would have to stop at the point that the limit for the least abundant species is caught.

6. Enforcement of a 'days at sea' approach may appear administratively simpler but an effort system still requires accurate monitoring and control of fishing-time and catches landed. Without them in place there are considerable risks of poor compliance and overfishing. Adding layers of rules to address the above risks, for example on catch composition, could make enforcement even more complex.

Principle 6: Allocate and manage quotas effectively to realise the environmental, social and economic benefits of maximum sustainable yield

Required policy measures:

1. Define the environmental, economic and social objectives of fisheries management in the UK and publish the criteria that will be used to allocate fishing opportunities to producer organisations and individual fishing businesses in order to meet these objectives, recognising that fisheries are a public resource.

2. Allocate fishing opportunities in line with these criteria, taking the steps necessary to ensure the government has control over this allocation process – including the ability to redistribute quota in the long term and clarify what fishing businesses should expect in terms of decisions on allocation in future.

3. Only allocate fishing opportunities to coastal states, producer organisations and fishing businesses that can demonstrate compliance with UK fisheries regulations.

Justification:

1. There were 5,637 UK registered fishing companies in 2014. Of these, 13 companies held approximately 60% of total UK Fixed Quota Allocations (European Parliament, 2016)

2. The government has discretion with regard to the annual allocation of quota, and can distribute quota differently each year if it so wishes, as long as this is done after due consideration, fairly, proportionally and subject to public consultation and a right of appeal (ClientEarth, 2013).

3. To ensure the public understands and has a say in how public resources are managed, the government should be clear on the objectives of fisheries management policy and the trade-offs they intend to make to achieve environmental, economic and social priorities. Recognising the significant difference between fisheries in UK waters it may be beneficial to identify different objectives for different fleets (for example, but not limited to: pelagic compared to demersal, or fisheries in different geographic areas). Once objectives are agreed, the publication of clear criteria defining how fishing opportunities will be allocated will help improve transparency and enable objective evaluation of fisheries performance against the agreed objectives.

4. UK fish stocks are a common resource and should be fished for the benefit of wider society. Quota should only be allocated to producer organisations and fishing businesses that can deliver the environmental, economic and social objectives identified for the fishery and demonstrate compliance with fishing regulations.

Principle 7: Implement measures to ensure compliance and high levels of confidence in the achievement of domestic and international policy objectives, including combatting Illegal, Unreported, and Unregulated (IUU) fishing.

Required policy measures:

1. Require full documentation of all fishing that takes place in UK waters including through the use of Remote Electronic Monitoring (REM) equipment.

2. Require comprehensive monitoring, control and enforcement (MCE) measures at sea and on land that enables full documentation of the catch and carriage of all harvested fish.

3. Cooperate on effective international IUU legislation[16] in domestic legislation and align UK policy with the EU "carding" process for trade with countries associated with IUU fishing practices. An integral element of this will be the drawing up of a national plan of action to counter IUU activity.[17]

4. Ratify and implement the FAO sponsored Port States Measures Agreement (PSMA) [18] to prevent, deter and eliminate IUU in the UK overseas territories' EEZs.

5. Adopt and enforce the FAO voluntary guidelines on Flag State responsibilities[19] so that all vessels operating in UK waters are uniquely identified, and those over 12m have an IMO number.

6. Share fisheries surveillance information across government departments to improve understanding of the actions of vessels at sea.

7. Join and become an active participant in the Regional Fisheries Management Organisations (RFMOs) that oversee fisheries in, or adjacent to, the waters of UK overseas territories.

Justification:

1. Comprehensive MCE will ensure that management decisions are being complied with by UK vessels wherever they operate, and non-UK vessels accessing UK waters, while providing opportunities to improve best available evidence and strengthen the basis of future fisheries management decisions.

2. To support a level playing field with neighbouring coastal states, the UK needs to agree minimum standards for MCE measures as part of its agreement on the joint management of shared stocks.

3. Full documentation of the catch and carriage of fish enhances confidence on the source and provenance of fish in the supply chain, adding value and enabling retailers to increase consumer confidence.

4. By demonstrating compliance with regulations, fishing businesses will strengthen their case for securing government and other incentives that are allocated on environmental and social performance criteria.

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[16] For example, EU IUU Fishing Regulations
[17] For example, National Plans of action against IUU
[18] Port State Measures Agreement
[19] FAO voluntary guidelines on Flag State responsibilities

5. Existing EU regulations to combat IUU are comprehensive and should be replicated and implemented by the UK. The UK could become a leader in combating a multi-billion dollar crime sector that impacts global maritime and food security if it fully implements measures such as PSMA and undertaking Flag State responsibilities.

6. Understanding what is occurring in, and in the immediate vicinity, of UK waters is important to fisheries and security departments. Currently the European Maritime Safety Agency centrally collects, collates and disseminates non-military maritime surveillance information for the EU.

7. RFMOs are well established international organisations, providing a forum for countries with fishing interests in a particular area to agree management measures. Currently the EU plays an active role in six tuna related organisations and 11 non-tuna organisations. The UK should assess which RFMOs it wishes to be represented in, based on an analysis of the level of UK engagement in the relevant fisheries, the area of origin of the fisheries products consumed in the UK, and the requirements of the UK Dependent Territories.

Principle 8: Maintain a prohibition on the discarding of fish and support the catch sector to increase the selectivity of fisheries

Required policy measures:

1. Maintain the prohibition of discarding fish that are subject to catch limits[20].
2. Manage quota effectively to optimise the use of fishing opportunities.
3. Require full documentation of fish catch to ensure the aims of the discard ban are achieved.
4. Implement measures that enable and incentivise the catch sector to increase selectivity of fisheries and minimise the wasteful practice of discarding. These measures should include: avoidance (e.g. through the establishment of protected or restricted areas, or the application of "move-on rules"), selectivity (e.g. through gear trials or technical measures).

Justification:

1. During the most recent reform of the Common Fisheries Policy, the UK Government championed the need to improve selectivity and end the wasteful practice of throwing

[20] Article 15 of the CFP: "All catches of regulated commercial species should be brought and retained on board vessels, recorded, landed and counted against the quotas, where applicable by 1 January 2019, unless exempted through a formalised, evidence-based process."

unwanted fish back into the sea. With the support of the public, the UK was successful in ensuring the 'Landing Obligation' was adopted as part of EU law in 2014.

2. Article 15 of the CFP requires the UK and other member states to fully implement the landing obligation by 1 January 2019, before the UK exits the European Union.

   By continuing to implement the requirements of the Landing Obligation and managing quota more effectively once it becomes an independent coastal state, the UK will maximise the ecological and economic benefits that stem from eliminating unseen discarding.

3. Through the active implementation of the suite of measures provided for in the EU's Landing Obligation, and the introduction of targeted incentives and domestic measures the UK can improve the data used to inform management decisions while ensuring quota is used most effectively.

Principle 9: Manage fisheries transparently recognising fish stocks are a shared public resource

Required policy measures:

1. Domestic legislation should require:

   a. the development of new fisheries legislation to be participatory and UK governments to have a responsibility to publish the evidence to be used when making fisheries management decisions; and

   b. UK governments to establish fisheries advisory bodies that enable all interested parties, including the various fleet segments, scientific advisors, environment and civil society organisations to be involved in participatory processes that result in decisions to manage fish stocks for the benefit of wider society.

2. Fishing limits for stocks in UK waters, and the UK's position on these limits in international fora, should be set through a transparent process, with appropriate stakeholder involvement and parliamentary scrutiny.

3. As a signatory to the Aarhus Convention[21], UK governments should proactively make information publically available to improve access to information, public participation in decision-making and access to justice in environmental matters.

[21] The Aarhus Convention and its Protocol empower people with the rights to access easily information, participate effectively in decision-making in environmental matters and to seek justice if their rights were violated. They protect every person's right to live in an environment adequate to his or her health and well-being. https://www.unece.org/env/pp/welcome.html

Justification:

1. As reported by Transparency International the current European Council process to determine annual TACs is opaque with little or no accountability (Transparency International, 2016). As an independent coastal state the UK can greatly improve on this by stipulating the terms under which it conducts its negotiations on access to UK waters and TACs for shared stocks.

2. UK governments must consider the full range of information and perspectives during fisheries management decision making processes and those processes should be open to judicial review by any citizen to ensure legal standards are respected.

3. Currently only the first pillar of the Aarhus Convention (on access to environmental information) is implemented in England and Wales by the Environmental Information Regulations 2004 (SI 2004/3391).

Endnotes

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