HOUSES OF PARLIAMENT
PARLIAMENTARY OFFICE OF SCIENCE & TECHNOLOGY

POSTNOTE

Number 357 May 2010

EU Fisheries Management

The existing Common Fisheries Policy (CFP) has not delivered sustainable fisheries for Europe. In addition to lost fisheries productivity, there have been unwanted impacts on the marine environment and economically inefficient fisheries that are more vulnerable to financial shocks. The recent European Commission (EC) Green Paper on the reform of the CFP reconfirms the need to adopt an ecosystem approach to ensure the CFP supports the Marine Strategy Framework Directive. This POSTnote describes challenges to ecosystem-based fisheries management and how these might be tackled.

Overview

- Europe's Integrated Maritime Policy has made ecosystem-based fisheries management obligatory in the 2012 reform of the Common Fisheries Policy.
- Ecosystem-based fisheries management would require a combination of regulations and tools such as scientifically-based quotas and economic incentives, along with local management such as selective fishing gear and fishing area closures.
- Fisheries management failings under the EU Common Fisheries Policy have resulted in depleted fish stocks.
- Ecosystem-based fisheries management has been successfully implemented in some countries, even where there are gaps in scientific knowledge. A variety of management tools already exist to help meet the objectives of the approach.
- Harnessing fishers' knowledge and collaboration between stakeholders are fundamental to the success of ecosystem-based management.

Background

Reform of the Common Fisheries Policy

The EC reports that 88% of European stocks are being fished beyond sustainable levels and 30% of stocks are close to collapse.[1] The EC recognises the failings of the existing Common Fisheries Policy (CFP). In preparation for the Policy's reform in 2012, it has recently suggested changes in the ways that European fisheries are managed. These are intended to: reduce the number of vessels in the fishing fleet, provide precise management objectives and support longer-term decision-making that places more responsibility on the industry and increases compliance.

Commitments to ecosystem-based fisheries management already exist.[2] However, this has not been achieved and so the EC has reconfirmed its commitment.[1] In part, this will ensure that the CFP fully supports the achievement of "good environmental status" as required by the existing Marine Strategy Framework Directive (Box 1).

Condition of the UK Fishing Industry

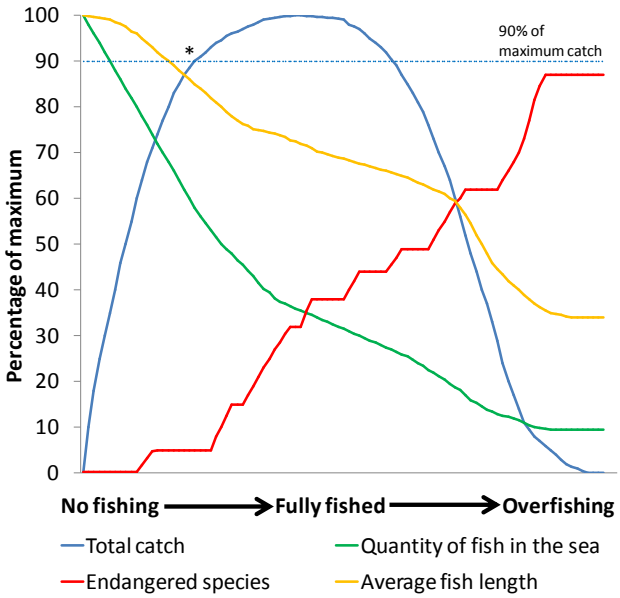
The UK sea fisheries locations landing the largest tonnage of fish are the Shetland Isles, Scrabster and Peterhead in Scotland, Brixham and Plymouth in southwest England, and Ardglas in Northern Ireland. The total number of UK full or part-time "fishers" has fallen by a quarter since 1999 from 16,900 to 12,800 in 2008.[3] UK fishing production peaked in 1930 with 1.1 million tonnes brought ashore, but fell to 409 thousand tonnes by 2008.

The decline in fish stocks has been caused by overfishing, resulting in vulnerability to even small changes in trade or the economy.[1] While annual fleet reductions were intended to help counteract the decline in fish stocks, these have been outstripped by technical advances in fishing gear and boat technology. Many stocks are dominated by immature fish because few fish survive to adulthood when exploitation rates are too high. For example, in the North Sea an estimated 93% of cod are fished before they can breed.[1]

Managing Fisheries

Sustaining fisheries requires that managers achieve an acceptable balance between the benefits that fisheries provide and their impacts on the future sustainability of fish stocks and the environment. The figure shows the types of tradeoffs that need to be considered when trying to achieve this balance.[4] As fishing increases so the total catch rises to a maximum and then declines. This affects the abundance and average size of fish and can have wider impacts on the ecosystem (see Figure 1). Some of the more vulnerable species can become endangered.

Figure 1: The tradeoffs between fishing, the state of fish stocks and other marine species.[4]



Fishing at the lower rate that gives around 90% of the maximum catch (* on the figure), leads to a small loss in potential catch. However, fishing at this level typically improves the economic performance of fisheries and minimises unwanted impacts on ecosystems. There are short-term economic and social costs (for example, the possibility of unemployed fishers) associated with trying to fish stocks to levels that minimise unwanted impacts on ecosystems and provide long-term economic benefits.

Common Fisheries Policy

The CFP 2002 is the EU's current policy for managing fisheries. It aims to balance three dimensions of sustainable development: (1) environmental protection, (2) social equity and cohesion, and (3) economic prosperity.[1] One of the CFP's methods to achieve this is setting total allowable catches for different species of fish and dividing this into quotas for member states (POSTnote 251). However, in practice the policy is widely viewed as not having achieved successful management. For instance, in 2008, the total allowable catches adopted by European Council were on average about 48% higher than the catches that scientists considered sustainable.[5]

Overall, fishers, scientists, conservation agencies and the Commission itself have identified five main structural failings of the CFP:

- a lack of political will to enforce CFP rules and limits;
- too many vessels in the fishing fleet;
- imprecise policy objectives resulting in insufficient guidance for making decisions;
- a decision-making system that encourages a short-term focus;
- a framework that does not give sufficient responsibility to the industry and poor compliance by the fishing industry.[1]

Box 1. The UK's Commitment to Ecosystem-Based Management

The UK's national commitment to the ecosystem approach is through the Marine and Coastal Access Act 2009 (known as the Marine Act).[6] The main international commitment is through the European Integrated Maritime Policy (IMP). The Marine Strategy Framework Directive (MSFD) is the environmental pillar of the IMP. Other international agreements include the Convention on Biological Diversity and the declaration of the World Summit on Sustainable Development.[9]

EU Marine Strategy Framework Directive[7]

The goal of the MSFD is to 'protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected'. The Directive must be implemented by member states by July 2010. It defines "good environmental status" and aims for it to be achieved in the EU's marine waters by 2020, by applying an ecosystem approach. The purpose is to protect the ecosystem goods, services and functioning which provide the resource base on which marine-related economic and social activities depend. The Directive operates at the regional seas level. These are geographic areas with characteristic ecosystems; e.g. particular species assemblages, habitats and environmental conditions. Within the North-East Atlantic marine region, the UK's sub-regions are the Greater North Sea and Celtic Sea.

Marine Protected Areas

Under the MSFD, a programme of measures must be implemented to maintain or achieve "good environmental status". This includes a network of marine protected areas which give special protection from certain human activities (POSTnote 234).[8] Levels of protection vary, e.g. from fully protected permanent marine reserves to the banning of specific damaging activities such as all fishing or specific fishing gears from certain areas, for example through seasonal closures of breeding grounds.

UK Marine and Coastal Access Act 2009[6]

The Marine Act includes new powers and a range of specific measures to protect and manage UK waters, and to help to achieve the MSFD's aim of "good environmental status". Under the Marine Act a high level Marine Policy Statement will be published in summer 2010 to help to steer marine planning and decisions by public bodies and regulators, such as the new Inshore Fisheries and Conservation Authorities.[8] The Act enables creation of marine plans and marine conservation zones (POSTnote 310), designed to achieve an ecologically coherent network of marine protected areas. These also contribute to furthering the achievement of "good environmental status" in marine regions under the Directive.

Unless changes are made to current management methods, the decline in fisheries resources and the profitability of fisheries are expected to continue. Attempts to address the structural failings of the existing CFP and to achieve an acceptable balance between fisheries benefits and environmental impacts could be supported by the adoption of ecosystem-based fishery management.[1,9]

When the reformed CFP is implemented in 2013, it needs to provide the right instruments to support the MSFD. This is in the interest of the fishing sector because the approach can also address the impacts of other sectors on fisheries resources in a proportionate and coherent way.

Conservation agencies[10] and other stakeholders[11] consider a strategic management approach, with greater devolution of decision-making to regions, is the best way to tackle the structural failings of the CFP.

Marine Strategy Framework Directive

Adoption of an ecosystem approach to the management of human activities in the marine environment is identified as an overarching objective in various international agreements (Box 1). The Marine Strategy Framework Directive (MSFD 2008) builds on these commitments at the European scale and obliges EU member states to apply an ecosystem approach. All other EU maritime policies must comply with and support this approach, including the CFP. The MSFD's target is to achieve or maintain "good environmental status" by 2020.[7] Actions to ensure the sustainability of fishing impacts and fish stocks, and thus to achieve "good environmental status" will have to be delivered by the CFP.[9]

Regionalisation of Fisheries Management

The European Council and Parliament are responsible for high level decisions, such as setting overall policy and harvest objectives and deciding the balance between social, economic and environmental sustainability. Some actions need to be taken at this high level, such as recent regulation to prevent, deter and eliminate illegal and unregulated fishing.[12]

At present, detailed decisions on relatively minor aspects of fisheries management are also made by these high level bodies. However, the MSFD specifies that achievement of "good environmental status" should be delivered at a regional level and the actions devolved to member states (Box 1). As the CFP is closely linked to the Directive, greater regionalisation of control is recognised as being an important step towards ecosystem-based management.[10] Steps towards this had already been made with the 2002 reform of the CFP which enabled the setting up of Regional Advisory Councils to provide management guidance on the CFP at a regional sea scale.

Ecosystem-Based Fisheries Management

Ecosystem-based fisheries management ensures that fisheries support the objectives of the ecosystem approach, balancing environmental, social and economic benefits. The EC considers that the approach will help to ensure, 'goods and services from living aquatic resources for present and future generations within meaningful ecological boundaries. Such fisheries management will strive to ensure that benefits from living marine resources are high while the direct and indirect impacts of fishing operations on marine ecosystems are low and not detrimental to the future functioning, diversity and integrity of these ecosystems'.[9] This is consistent with definitions put forward by the Food and Agriculture Organisation and other bodies.[13]

Dealing With Uncertainty

New gaps in knowledge have opened up now that legislation requires managers to consider ecosystem components and connections, such as how to identify the rates and types of fishing that ensure long-term sustainability of ecosystems. In developing management methods it is also necessary to recognise the potential impacts of environmental changes:

- fauna and flora changes occur as part of natural ecosystem variation over time (POSTnote 281).
- climate change may have altered plankton composition and distribution in EU seas, with consequences for the whole food chain (POSTnote 341).[14]
- ocean acidification can damage shell-forming organisms, threatening ecosystems and shellfish stocks (POSTnote 343).

Although there is uncertainty, many of the important steps toward ecosystem-based management can rely on existing knowledge. A comprehensive picture of the marine environment will remain elusive,[15] but is not a prerequisite for implementing ecosystem-based fisheries management.

Monitoring and Adaptive Management

Ecosystem indicators (POSTnote 312), adaptive management and using a precautionary approach can aid decision-making.[9] This means a strategy of monitoring the outcomes of management decisions, while restricting new activities until their potential effects have been assessed. Periodically, management is reassessed and modified in the light of new evidence and knowledge. Environmental Impact Assessments and Strategic Environmental Assessments might also be used (POSTnote 223).[16,17]

Management Tools

Some countries have shown how much progress can be made with their existing science and knowledge (Box 2). They have successfully applied an ecosystem approach to large and small-scale fisheries. A range of tools can be used to meet the objectives of ecosystem-based management of fisheries. For example, catch control, fishing "effort" control, modifying fishing gear and closing areas to fishing. The tools need to reflect the characteristics of the fishery, the impacts of fishing gear, the environment and the governance system.

Controlling Catches

A simple initial step is to reduce fish mortality rates to levels that ensure sustainability of target stocks. This leads to an overall reduction in exploitation rates that benefits other aspects of the ecosystem and helps to meet the objectives of ecosystem-based fisheries management.

Discarding

Unwanted fish or marine creatures caught unintentionally are discarded at sea by fishers. Most discarded fish die, so excessive discarding may be a significant cause of declining fish populations. However, discards can become food for other organisms and reductions in the level of discards may impact marine food webs and associated ecological processes. Simply increasing total allowable catches so that all caught fish are brought into port is not a solution, because overfishing is still not discouraged. If all caught fish were landed in port and sold, without adequate enforcement this could potentially encourage catching of undersized fish, thereby further depleting populations.[18]

Modifying Fishing Gear

Improved selectivity of fishing gear is important to allow juvenile fish to grow and reproduce before being caught and to avoid catching non-targeted species (Box 3).

Box 2. Ecosystem-Based Management in Practice

Large-scale Fishery

Ecosystem-based fisheries management has resulted in highly successful fish stock rebuilding efforts in California, the northeast United States and northwest Australia. Efforts have involved experimentation with closed areas, gear and "effort" restrictions, and new approaches to catch allocation and enforcement.[4] South Australia has made long-term plans for each of its large-scale marine ecosystem zones. Activities such as fishing, aquaculture, or tourism are managed and balanced to try to minimise damage, according to the resilience or sensitivity of the ecosystem.[19]

Small-scale Fishery

Rebuilding small-scale fisheries is a significant challenge in developing countries where fishers have no alternative food or employment source. Nevertheless there have been successful forms of governance involving local communities in a co-management arrangement with government or nongovernmental organisations. For instance, in Kenya increased fishing in a coral reef over a 10 year period resulted in decreased catch size and falling biodiversity.[20] A combination of closed areas and exclusion of unselective fishing gear led to recovery of size, quantity and diversity of available fish, and a rise in fishers' income.

Protected Areas

Excluding fishing from areas can be a useful tool for protecting habitats and species, as part of a wider management approach (Box 1 and POSTnote 310). However, there are major issues with management of the commercially important species such as cod because closing areas might displace fishing in unpredictable ways.[21] For example, in 2001, an area of the North Sea was temporarily closed to cod fishing as part of the stock recovery programme. Fishing was displaced to adjacent grounds, resulting in adverse effects in those areas.

This poses a challenge as to how closures are implemented. For example, the International Council for the Exploration of the Sea recommended closing a zone of cold water coral reefs near Rockall (a small rock in the North Atlantic between Scotland and Iceland).[22] The Scottish Fishermen's Federation and the WWF were among the collaborators when the boundaries of the closed area were delineated both to protect the habitat and to minimise displaced fishing activity.[23]

The effects of protected areas on fish are mixed, as species respond differently.[24] The success of protected areas for increasing fish stocks depends on the biology and migrations of the species. Protected areas must be carefully planned, monitored and evaluated.[25]

Working in Partnership

Fishers have a wealth of knowledge and experience that can be used, for example through the Fisheries Science Partnership. This encourages commercial fishers and government fisheries scientists to work together in planning scientific studies. It explores new scientific methods and more selective fishing methods (Box 3). Analysis of fifteen European pilot projects on reducing discards highlights the importance of involving the fishing industry.[26]

Box 3. Examples of Selective Fishing Gear

Prawn Trawling

Some fishers in the North Sea have begun catching prawns using multiple small trawl nets rigged together, with narrow openings. Traditional gear has a few, large, nets with wide openings. In scientific trials, the multi-rig trawl almost doubled the catch of prawns, but caught around 50% fewer unwanted fish that might otherwise have been discarded.[27]

Bass Fishing

The shape of mesh panels in traditional fishing nets can be distorted when hauled through the sea. A project in South Wales trialled square-mesh panels in a bass fishery in August 2009. Fishers and scientists found that square-mesh panels retained their shape better while fishing. Fewer undersized bass were caught in the new nets compared with the traditional mesh panels (11% compared with 30%). Video footage showed that small bass escaped. The number of discards of other species caught was on average 14% lower when using the square-mesh section.[28]

The North Sea Regional Advisory Council has proposed that the fishing industry collaborates with scientists and economists to draft sustainable fishing plans. These would specify how fishers will operate for the following 3–5 years, including types of fishing gear, minimising impacts on the seabed and discard reductions. Auditing fishers' compliance with the plans reverses the burden of proof and puts it back on to fishers.[29]

Successful adaptation to natural variability and to the consequences of climate change is more likely where there is a continuous cycle of management and review at a regional scale. Drawing on fishers' local knowledge means that regional plans can be adapted quickly in reaction to changed environmental conditions. This is central to achieving ecosystem-based management in the long term.

Endnotes

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POST is an office of both Houses of Parliament, charged with providing independent and balanced analysis of policy issues that have a basis in science and technology. POST is grateful to Jo Foden for researching this briefing, to the NERC for funding her parliamentary fellowship, and to all contributors and reviewers. For further information on this subject, please contact the co-author, Dr Jonathan Wentworth, at POST.