

How (not) to implement the ecosystem-based approach when setting Total Allowable Catches (TACs)?

Fisheries management under the Common Fisheries Policy (CFP) of the European Union (EU) has to follow an 'ecosystem-based approach'. In simple terms, this means that it has to take into account the living and non-living components of the ecosystem, its dynamics and processes, and how these are affected by human activities in the marine environment – while preserving the integrity and functioning of the ecosystem and its elements. EU decision-makers in Brussels setting catch limits for fish stocks are a bit like central bankers in Frankfurt setting interest rates. Ostensibly, the numbers they settle on have a discrete, single, clearly-defined impact (how many tonnes of a particular stock can be pulled out of the ocean; how much it will cost to borrow money). But the effects those numbers have are innumerable on the wider marine or economic environment, and that is why we care.

Dealing with these wider effects is not easy. This note is designed for decision-makers at EU level – mainly in the European Commission, which makes proposals, and the Council of the EU, where national ministers come together to make decisions. Ecosystems can be very complex and thus difficult to understand fully. Modelling them in their entirety or even predicting the likely impacts of a particular action, let alone using this to inform concrete management decisions, is not an easy undertaking. It requires a lot of knowledge and assumptions. Uncertainty around available information and the assumptions made to bridge knowledge gaps often makes fisheries managers hesitant to use such ecosystem considerations when taking decisions.

This document provides an overview of the types of information that can and should be considered, for example, when setting Total Allowable Catches (TACs) to limit fishing to sustainable levels, as well as examples of management behaviour that violate the ecosystem-based approach.

What the law says

There are numerous references in EU and international law to the concept of an ‘ecosystem-based approach’ to the management of human activities, including fisheries.¹

The United Nations Fish Stocks Agreement, to which the EU is a party, requires an assessment of the impacts of fishing, other human activities, and environmental factors not only on target stocks but also on species belonging to the same ecosystem and species associated with or dependent on the target stocks.² It also requires the adoption of conservation and management measures for those other species.³

The references to the ‘ecosystem-based approach’ in the EU’s Marine Strategy Framework Directive (MSFD) and the CFP are more concrete:

- The CFP Basic Regulation defines the ecosystem-based approach to fisheries management as ‘an **integrated approach to managing fisheries within ecologically meaningful boundaries** which seeks to manage the use of natural resources, **taking account of fishing and other human activities**, while **preserving both the biological wealth and the biological processes necessary to safeguard the composition, structure and functioning of the habitats of the ecosystem affected**, by **taking into account the knowledge and uncertainties** regarding biotic, abiotic and human components of ecosystems’⁴ (emphasis added).
- It also states that ‘[t]he CFP shall implement the **ecosystem-based approach to fisheries management** so as to **ensure that negative impacts of fishing activities on the marine ecosystem are minimised**, and shall endeavour to ensure that aquaculture and **fisheries activities avoid the degradation of the marine environment**’⁵ (emphasis added).
- The MSFD requires that the EU Member States’ ‘[m]arine strategies [...] apply an **ecosystem-based approach** to the management of human activities, **ensuring that the collective pressure** of such activities **is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised**, while enabling the sustainable use of marine goods and services by present and future generations’⁶ (emphasis added).

The CFP Basic Regulation also contains a number of other objectives and requirements that are closely linked to the ecosystem-based approach. These include:

- Progressively restoring and maintaining populations of fish stocks above biomass levels capable of producing maximum sustainable yield, which applies to all ‘harvested species’,⁷ without distinction between deliberately targeted species and those taken as unintended bycatch;

¹ See, e.g. Convention on Biological Diversity (1992), preamble: ‘the fundamental requirement for the conservation of biological diversity is the in-situ conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings’.
<https://www.cbd.int/doc/legal/cbd-en.pdf>, p. 3.

² United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks, 1993–1995, New York.
http://www.un.org/Depts/los/convention_agreements/convention_overview_fish_stocks.htm, Article 5(d).

³ *Ibid.*, Article 5(e).

⁴ Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy. Referred to as ‘CFP Basic Regulation’ throughout this briefing. Article 4(1)(9).

⁵ *Ibid.*, Art. 2(3).

⁶ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). Article 1(3).

⁷ CFP Basic Regulation, Art. 2(2).

- The [precautionary approach to fisheries management](#),^{8,9}
- The requirement to gradually eliminate discards by avoiding and minimising unwanted catches,¹⁰
- The establishment of measures in accordance with the [best available scientific advice](#).^{11,12}

Taken together, these legal requirements place a duty on decision-makers not to treat individual parts of the ecosystem, such as a specific fish stock, in isolation. They must consider them in the context of the whole ecosystem, including its other living and non-living components, dynamics and processes.

Information to be considered

Given the complexity of marine ecosystems, it is no surprise that there are still a lot of questions we do not have definite answers to. However, scientists have come a long way in improving our understanding of the roles different species play, how they are linked with each other and what impact certain factors, for example climate change, have. Here are some examples of information EU decision-makers need to take into account, for example when setting TACs:

- **Mixed fisheries considerations.** These are scenarios developed by the International Council for the Exploration of the Seas (ICES), that highlight trade-offs between catch levels of different species.¹³ Such scenarios – based on underlying assumptions about the behaviour of the fleet – give an idea of which stocks will be more or less limiting. For example, they highlight which stocks may have to be fished below the scientific advice given for the stock individually in order not to overfish other more vulnerable stocks caught in the mix.
- **Ecosystem overviews.** These are developed by ICES to highlight and explain key aspects and dynamics of different ecoregions. They explain the relative importance of different pressures and set out findings about the overall state of the ecosystem.¹⁴ These overviews give a clear indication of which factors, other than fisheries, put a strain on the ecosystems or specific components of it.
- **Ecosystem modelling.** This is a rapidly evolving field of scientific work designed to operationalise the ecosystem-based approach. A good example is the WKIrish benchmark process – a series of workshops on developing an ecosystem-based approach to fishery management for the Irish Sea.¹⁵ WKIrish brought together scientists and stakeholders with an interest in the Irish Sea to develop and improve ecosystem models, incorporating information on foodweb dynamics, environmental factors and fishing activities. WKIrish's findings represent a key step towards the implementation of an ecosystem-based approach. They explore how to factor the state of the ecosystem into fisheries management, how to explore ecosystem dynamics and the relative importance of different factors, and how to investigate the impact of potential management actions.

There is a lot of work ongoing on moving from single stock catch advice towards incorporating multi-species interactions and environmental factors, for example in the development of biological reference

8 *Ibid.*

9 ClientEarth (2020). Caution! A TAC-Setter's Guide to the 'Precautionary Approach'. December 2020. <https://www.clientearth.org/latest/documents/caution-a-tac-setter-s-guide-to-the-precautionary-approach/>

10 CFP Basic Regulation, Art. 2(5)(a).

11 *Ibid.*, Article 3(c).

12 ClientEarth (2020). What is the 'best available scientific advice' for setting Total Allowable Catches (TACs)? December 2020.

<https://www.clientearth.org/latest/documents/what-is-the-best-available-scientific-advice-for-setting-total-allowable-catches-tacs/>

13 For example for the Celtic Sea: ICES (2019). Celtic Seas ecoregion – Fisheries overview, including mixed-fisheries considerations. 17 December 2019.

https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/FisheriesOverviews_CelticSeas_2019.pdf

14 For example for the North Sea: ICES (2019). Greater North Sea Ecoregion – Ecosystem overview. 12 December 2019.

https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/EcosystemOverview_GreaterNorthSea_2019.pdf

15 See for example the most recent meeting report: ICES. 2020. Workshop on an Ecosystem Based Approach to Fishery Management for the Irish Sea (WKIrish6; outputs from 2019 meeting). ICES Scientific Reports. 2:4. 32 pp. <http://doi.org/10.17895/ices.pub.5551>.

points.¹⁶ If EU decision-makers are to live up to their legal obligations, they need to follow these developments closely.

What should EU decision-makers do?

There will always be a degree of uncertainty around the exact nature and extent of certain interactions and processes. That is how ecosystems (like economies) work. In that context, EU decision-makers must use whatever information exists, for example to identify links between species and fisheries they need to consider in their decision-making. This is not optional: under EU law decision-makers need to consider both *'the knowledge and uncertainties regarding biotic, abiotic and human components of ecosystems'*.¹⁷ In accordance with the [precautionary approach](#) this means being more cautious when uncertainty is higher, i.e. being more protective of the ecosystem and its components when information is more limited.

In practice, examples of actions EU decision-makers could and should take in line with an ecosystem-based approach, even while information gaps remain, include the following:

- In mixed fisheries, set TACs for more abundant stocks below their single-stock advice, where this is necessary to safeguard vulnerable stocks that are caught in the same fisheries alongside the more abundant stock and are in a bad or unknown state.
- Set TACs below the single-stock advice where stocks are subject to additional pressures or stressors that are not (yet) explicitly factored into the advice. This is important to account for potential cumulative impacts of fisheries and other aspects like environmental factors.
- Reduce the catch of forage (small prey) fish in order not to jeopardise their important function for the ecosystem. Some fish, like sandeel, are an important food source for example for seabirds. Decision-makers can give effect to their legal obligation to take an ecosystem-based approach by requesting ICES to consider this when providing catch advice, or by deducting a 'reserve' to cover ecosystem needs when setting the TAC.
- Require effective selectivity and conservation measures to protect bycatch species and habitats.
- Support the incorporation of ecosystem considerations into ICES advice on sustainable catches.
- Urgently improve data collection and implement full [catch documentation](#) to provide a more robust basis for sustainable fisheries management.¹⁸ This is crucial to manage fisheries properly.

What should EU decision makers not do?

Unfortunately, decision-makers often make decisions that directly violate the ecosystem-based approach, contrary to what EU law requires. This is mostly based on the underlying tendency to prioritise certain stocks over others based on commercial value and regardless of their function within the ecosystem. Examples include:

- Setting ['bycatch TACs' above scientific advice](#) to avoid 'choking' (i.e. closing fisheries, due to fishers not having quota for one or more stocks while quota for the target stock(s) is still available);

¹⁶ For example, as part of the recent ICES WKRPChange workshop, Workshop of Fisheries Management Reference Points in a Changing Environment, 21-24 September 2020. <https://www.ices.dk/community/groups/Pages/WKRPChange.aspx>

¹⁷ Article 4(1)(9) of the CFP Basic Regulation, defining 'ecosystem-based approach to fisheries management'.

¹⁸ See ClientEarth's recent briefing on the importance of robust catch documentation: ClientEarth (2020). (Lack of) catch documentation under the landing obligation and how exemptions may defeat rather than prove the rule. December 2020. <https://www.clientearth.org/latest/documents/lack-of-catch-documentation-under-the-landing-obligation-and-how-exemptions-may-defeat-rather-than-prove-the-rule/>

- The removal of TACs to avoid such ‘choke’ situations, without implementing effective measures to safeguard stocks whose TACs are removed;
- Failing to take effective action to rebuild depleted bycatch stocks;
- Failing to make sufficient efforts to improve data collection;
- Requesting countless [exemptions from the landing obligation without robust monitoring of their use](#);
- Adopting technical measures about the selectivity of gear that fail to prioritise the survival of the escaped fish, which ‘solves’ the discard problem cosmetically without benefiting the stocks in question;
- Failing to account for ecosystem needs like food supply for seabirds when setting TACs for key forage fish, such as sandeel, that are caught in industrial fisheries.

Conclusion: use available information and do not treat stocks in isolation

The complexity of ecosystems and their functioning makes it impossible to know and understand every little detail. However, there is already a lot of information that EU decision-makers are obligated to use to respect their legal duty to take an ecosystem-based approach. For example, they must identify and explicitly consider the dynamics and interactions between species, fisheries and environmental factors.

Central bankers setting interest rates never have all the information they want. But they have to act on all the knowledge available. The focus in Frankfurt is on getting the balance right between inflation and unemployment. This is not unlike the decision-makers in Brussels setting TACs and trying to keep fisheries sustainable both environmentally and socioeconomically. The figure they set will affect the economy, or the ecosystem, in a host of complex, hard-to-predict ways. The CFP is explicit: EU decision-makers must look beyond the balance between single-stock sustainability and socio-economic concerns, to consider the complex ecosystem impacts of the catch limits they set.

This means delving into complexity and, in the current state of our marine ecosystems, being more cautious. They must not treat individual fish stocks in isolation or use uncertainty or data gaps as an excuse to delay or fail to take action to safeguard ecosystems and their components and processes. On the most basic level, they must exercise extra caution wherever additional environmental or human pressures on top of fisheries apply or where fisheries compete for food with seabirds, cetaceans or other species, for example by setting TACs at lower levels. And they should keep up to date with the state of the art in ecosystem science and make sure that knowledge gaps are filled as soon as possible.

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