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05 May 2020

Subject: Implementation of an Ecosystem Approach to Fisheries Management

Dear Miguel de Serpa Soares,

Thank you for your letter requesting ICES views on the implementation of an ecosystem approach to fisheries management, as a contribution to Informal Consultations of States Parties to the Agreement for the implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.

I have noted that the physical meeting has been postponed until 2021, and deadline extended. However, I am pleased our contribution is now ready in the attached pages and may be posted online as appropriate.

Sincerely,



Anne Christine Brusendorff
General Secretary



ICES
CIEM

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the Exploration of the Sea

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Implementation of an ecosystem approach to fisheries management

The International Council for the Exploration of the Sea (ICES) is an intergovernmental science organization that coordinates and promotes marine research in the North Atlantic and its adjacent seas. ICES unites a community of more than 5000 marine scientists from over 300 institutes in 20 member countries and beyond.

ICES mission is to advance and share scientific understanding of marine ecosystems and the services they provide and to use this knowledge to generate state-of-the-art advice for meeting conservation, management, and sustainability goals. This advice supports ecosystem-based decision-making for the management of human activities in our seas and oceans, and contributes towards the effective application of an ecosystem approach. This approach seeks to maintain the health of marine ecosystems, alongside appropriate human use. For the benefit of current and future generation. ICES strives to provide ecosystem and sustainability science that will support the practical development and application of the ecosystem approach to fisheries management.

ICES is the key adviser for consequences and impacts of fishing on over 260 fish stocks in coastal state waters and ABNJ of the North East Atlantic and adjacent shelf seas. ICES is the science adviser to the North East Atlantic Fisheries Commission (NEAFC), and leading fisheries management adviser to North Atlantic Salmon Conservation Organization (NASCO), the EU, Norway, UK, and Iceland. ICES also provides advice upon request to Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and Baltic Marine Environment Protection Commission (HELCOM).

Ecosystem-based management (EBM), will contribute to the long-term sustainable use of marine resources, including the fisheries sector. EBM serves multiple objectives, involves effective stakeholder participation, and focuses on human behaviour as the central management dimension.

A more detailed description of the ICES approach to ecosystem-based management can be found in the ICES advisory plan¹. The Ecosystem and Fisheries Overviews are a key mechanism by which ICES identifies and disseminates the best available knowledge for ecosystem-based management. Subject to a rigorous peer-review process and formal approval by ICES Advisory Committee, the overviews are an ICES advisory product. These overviews complement ICES advice by prioritizing the top anthropogenic pressures on each marine ecosystem and allowing users to understand the implications of management decisions in an ecosystem context. They provide a concise and informative introduction to ecoregions, and to the human activities that take place within them, and key trends within each region. The overviews increase ICES capacity to provide the integrated ecosystem advice that is required to meet the needs of requesters of advice and society in general. The overviews are continuously evolving documents, addressing issues of interest such as climate change, and incorporating new knowledge.

¹ https://issuu.com/icesdk/docs/ices_advisory_plan

ICES uses the following tools and processes to provide the evidence into assess and address the impacts of fishing on the ecosystem:

Ecoregions: a long-standing process of dialogue between scientists and regional managers has resulted in ICES using defined spatial ecoregions as its key units for assessment and advice on fishing and the impact of fishing. The ICES integrated ecosystem assessment (IEA) expert groups allow ICES to regionalize further the development of methods in response to regional priorities.

Prioritisation of regional anthropogenic pressures: as part of the ecosystem overviews, the impact of pressures associated with fishing activity is assessed against other anthropogenic pressures in each ICES ecoregion. ICES publish a prioritized list of the top 3-6 anthropogenic pressures. ICES assesses that fishing is the activity that leads to the top anthropogenic pressures on the marine ecosystem in all but one of its ecoregions (the exception being the Baltic Sea).

Cumulative effects assessments: to increase the use of risk assessments and quantitative methods, ICES is developing a cumulative effects assessment (CEA) framework to further assess the impact of anthropogenic activity in each ecoregion. Worked examples are being developed for the North Sea and the Gulf of St Lawrence.

Vulnerable Marine Ecosystems (VME): ICES advises both NEAFC and the EU on the definition of fishing footprints, application of FAO guidelines on VME and uses data calls to assess the information underpinning recommendations for VME closures².

Bycatch of threatened and sensitive species: annual assessments take place of bycatch by fishing fleets within the ICES area. The bycatches of birds, sea mammals and fish species are assessed against international guidance for sustainability. ICES has developed a “bycatch roadmap” to chart further research and advice development and is working with fisheries managers and marine environmental commissions (OSPAR and HELCOM) to ensure future advice is credible and operational.

Fishing impact on the seafloor in shelf seas: ICES provides advice on assessments of fishing impact on [seafloor with particular attention to](#) physical loss and physical disturbance on benthic habitats. This assessment provides the evidence base for future decisions about the tradeoff between fisheries catch, the value of landings and the proportion of seabed projected. In almost all ecoregions considered, ICES assesses fishing as the activity that creates the highest pressure on the integrity of the seafloor and benthic species and habitats.

Evidence for EBM policy development: since 2005, ICES has been a key advisor to the EU on the development of the [Marine Strategy Framework Directive \(MSFD\)](#) and its descriptors of Good Environmental Status for species and habitat biodiversity, foodwebs, fisheries, seabed impact and underwater noise. ICES considers [Ecosystem-based Management](#) (EBM) as the guiding principle behind the MSFD. This ongoing advice is for both policy development and operational management. ICES also aids regional managers by assessing and addressing proposals for Ecologically and Biologically Significant Areas (EBSAs) and the impact of fishing on those areas.

Mixed fisheries advice: the fisheries overviews highlight the consequences and conflicts for meeting single stock management targets of the choices in setting annual fishing quotas in mixed fisheries. ICES

² <http://www.ices.dk/marine-data/data-portals/Pages/vulnerable-marine-ecosystems.aspx>

is developing further methods and communication techniques to enable managers to explore the consequences of a decision on one target stock on the other target stocks. ICES has developed MSY pretty good yield fisheries advice (95% of MSY yield), which is now being used operationally by the EU in its regional fisheries management plans.

Multispecies advice: where multispecies interactions and cannibalism are found to impact the management of fisheries, ICES provides advice that accounts for these interactions. Examples include predator prey interactions between capelin and cod, cannibalism in cod, time trends in natural mortality and considering top predators in forage fish fisheries.

Provision of data and evidence: ICES has an incrementally developing data policy. It has a commitment to making all of its data and evidence findable, accessible, interoperable, and reusable. ICES recognizes its obligation as an evidence provider an advisor to societal decision making on environmental policy and management ([Aarhus convention](#)). It strives to provide its evidence and advice through transparent, and trusted processes within the context of frameworks which are agreed with regional managers. Through the provision of online web services, ICES acknowledges that EBM requires evidence providers to be accountable and responsible for the veracity of the evidence, the credibility of the methods used and the legitimacy of their advice.

Lessons learned

Lessons learned from the ICES experience as a provider of evidence to the implementation of an ecosystem approach include the need for a regional focus while continuing to recognize the important of a pan-regional view. Maintaining close, constant, and meaningful dialogue with stakeholders (managers, commercial interests and environmental NGOs) is also critical to effective implementation of ecosystem approaches.

Some key lessons include:

- defining the ecoregions as the spatial units for monitoring, assessing and addressing EBM is a recursive process that requires many iterations between scientists across disciplines, and regional managers.
- evidence is required for robust EBM, but more science at ever greater spatial and temporal resolution does not necessarily lead to better EBM. Dialogue and scoping is required to ensure effective and salient evidence flow into the decision making process for EBM.
- ensure that models used inform the discussion on EBM, but do not allow one model to be perceived as a true and singular representation of the marine ecosystem.
- open and transparent data and knowledge provision is key to maintaining the legitimacy, trust and credibility of the evidence base for EBM.
- scoping is required to account for the mix of management objectives that are likely to impact fisheries management. Follow this scoping by developing agreed frameworks for the provision of evidence to address those management objectives.
- management objectives and their prioritisation will change over time, thus ensure that frameworks are evaluated over appropriate time frames.
- strive to balance qualitative and quantitative knowledge and accept that a key property of the system is that different knowledge sources will have differing degrees of certainty.

- build a common language and understanding to integrate diverse areas of knowledge such as natural, social, and economic sciences together with local knowledge.

Actions needed

Assertions

ICES and the [Atlantic Ocean Research Alliance Working group on the Ecosystem Approach to Ocean Health and Stressors](#) see the following assertions as important:

1. **Make the business case:** Ecosystem-based management enables new benefits and opportunities.
2. **Yes, we can!** Adequate mandates and effective tools exist for ecosystem-based management
3. **Diversify the conversation:** Integration of human dimensions is essential for ecosystem-based management;
4. **Stakeholders don't see their stake** (in EBM): we need to engage and target ocean literacy to professionals
5. **Commitment is key:** A sustainable future requires a sustained investment in ecosystem-based management;

Research and development needs

The ICES science plan³ lists the priority research areas for ICES. Specific to EBM and fisheries, ICES considers the following research areas as priority:

- a. Cumulative effect
- b. Functioning and connectivity of social ecological systems
- c. Ecosystem goods and services
- d. Synthesis of empirical evidence with societal values for trade-off analysis
- e. Implementation of cross-sectoral tools for ecosystem-based management advice
- f. Analysis of barriers to implementation of ecosystem-based management

Improving the foundation for knowledge provision

A durable mechanism needs to be established for sustained engagement and capacity building for stakeholders, scientists, and managers. Funding mechanisms must be aligned and shifted from a project-based approach to a more coordinated and sustained programmatic approach for ecosystem-based management. Ecosystem-based management must be reframed to highlight benefits build a stronger business case.

³ https://issuu.com/icesdk/docs/ices_science_plan_2019_web