COMMON OCEANS PROGRAM

Deep-sea fisheries project

# Developing guidance for supporting the implementation of an ecosystem approach to fisheries management by deep-sea RFMOs

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## Background paper for the EAFM Symposium

***"Applying the Ecosystem Approach to Fisheries Management in ABNJ"***

**11–13 March 2025**

# Contents

# Acronyms

| | |
|---|---|
| ABNJ | areas beyond national jurisdiction |
| BBNJ | biodiversity beyond national jurisdiction |
| CCAMLR | Commission for the Conservation of Antarctic Marine Living Resources |
| COFI | FAO Committee on Fisheries |
| DSF | Deep-Sea Fisheries |
| EAFM | ecosystem approach to fisheries management |
| FAO | Food and Agriculture Organization of the United Nations |
| GBF | Global biodiversity Framework |
| GFCM | General Fisheries Commission for the Mediterranean |
| ICES | International Council for the Exploration of the Seas |
| MCS | monitoring, control and surveillance |
| NAFO | Northwest Atlantic Fisheries Organization |
| NEAFC | North East Atlantic Fisheries Commission |
| (ds)RFMOs | (deep-sea) regional fisheries management organizations |
| SAI | significant adverse impact |
| SDG | sustainable development goals |
| SPRFMO | South Pacific Regional Fisheries Management Organization |
| UNCLOS | United Nations Convention on the Law of the Sea (also the Law of the Sea Convention) |
| UNFSA | United Nations Fish Stocks Agreement |
| UNGA | United Nations General Assembly |
| VME | Vulnerable marine ecosystem |
| VMS | vessel monitoring system |
| WSSD | World Summit on Sustainable Development |

# Introduction

## Objectives of this paper

This paper aims to provide background and direction to the upcoming "Applying the Ecosystem Approach to Fisheries Management in the ABNJ" symposium that will be organized by the DSF Project together with FAO, NAFO, and ICES to be held on 11–13 March 2025 at FAO headquarters, Rome.

## Justification and rationale for developing guidance

The deep-sea (ds)RFMOs manage demersal and small pelagic species not managed by other organisations are mandated to ensure that they consider the effects of fishing on the wider ecosystem. The details differ but is generally of the form "*fishing shall be commensurate with the sustainable use of fishery resources taking into account the impacts on non-target and associated or dependent species and the general obligation to protect and preserve the marine environment*" (SPRFMO (2022), Art.3, para 1(a)(ii)). In general, the dsRFMOs confine this to ecological considerations, although GFCM also include social and economic considerations (GFCM. 2014. Art. 2 para.2) and NEAFC note that their fisheries should provide sustainable economic, environmental and social benefits (NEAFC, 1980, Art. 2).

The dsRFMOs follow the general principles set out in the FAO EAF Guidelines (FAO, 2003) as relates to their mandate, but they have implemented an ecosystem approach to fisheries management (EAFM) selectively and differently among the regions under their jurisdiction. EAFM tends to be regarded as a scientific exercise with advice to reduce impacts on a few vulnerable taxa, like seabirds and deepwater sharks, and to protect fragile benthic habitats from bottom fishing such as vulnerable marine ecosystems. But an EAFM involves a more comprehensive consideration of issues affecting retained species, non-retained species and the ecosystem, the fishing industry, the consideration of external drivers and governance processes. Much of these considerations are already taken into account by the dsRFMOs but not necessarily recognized as part of an EAFM. The dsRFMOs would benefit from joint discussions and the development of guidance to consolidate their EAFM approach and strengthen implementation.

## Linkages to the Symposium

The symposium will explore the implementation of EAFM by the dsRFMOs particularly on the science and management of interactions of fisheries in the deep-sea ecosystems, and conclude with the development of a guidance document that can be adapted to suit regional needs consistent with the dsRFMO mandates. The symposium will be over three days: Day 1 is for scientific aspects, Day 2 is for management aspects, and Day 3 is the implementation of EAFM and developing the guidance document to assist in the implementation of EAFM by dsRFMOs.

The current background document aims to provide direction to the implementation of EAFM and the development of the guidance on Day 3, particularly by defining the scope of the ecological component of EAFM. This document will also provide direction for the science and management aspects for Days 1 and 2.

# What is EAF management?

The EAF (FAO, 2003) was developed from concerns voiced at the World Summit on Sustainable Development (WSSD, Johannesburg, South Africa, 2002) on the general state of sustainable fisheries and the ecosystems in which they occur. The ideas were not new, and the EAF principles are embedded in existing international legal instruments. The operationalizing these principles into practical fisheries management approaches is missing.

For instance, the need to account for ecosystem impacts of fishing was contained within UNCLOS (1982) in Article 119 paragraph 1:

> *1a … "to maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors, … taking into account fishing patterns, the interdependence of stocks…"*

and

> *1b … "take into consideration the effects on species associated with or dependent upon harvested species with a view to maintaining or restoring populations of such associated or dependent species above levels at which their reproduction may become seriously threatened."*

And the preamble of the UNFSA (1995) states:

> *"Conscious of the need to avoid adverse impacts on the marine environment, preserve biodiversity, maintain the integrity of marine ecosystems and minimize the risk of long-term or irreversible effects of fishing operations."*

with the text in UNCLOS being reiterated in the body of the UNFSA agreement. Hence, EAF as developed by FAO has a sound footing in both of these instruments.

The FAO Code of Conduct for Responsible Fisheries (FAO, 1995) in Article 6, paragraph 2, expands on the need to maintain important societal benefits associated to fisheries, while ensuring the conservation of stocks and ecosystems.:

> *"Fisheries management should promote the maintenance of the quality, diversity and availability of fishery resources in sufficient quantities for present and future generations in the context of food security, poverty alleviation and sustainable development. Management measures should not only ensure the conservation of target species but also of species belonging".*

The technical guidelines for the EAF was developed by FAO (2003) to supplement and provide a practical approach to implement the Code of Conduct for Responsible Fisheries. The guidelines define EAF as:

> *"An ecosystem approach to fisheries (EAF) strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties of biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries. (Section 1.2, page 14.).*

To facilitate implementation of the guidelines, FAO has prepared various supplements and tools, including best practices in ecosystem modelling (FAO, 2008), and the human dimension to EAF (FAO, 2009 These have been further supported by FAO developing an EAF toolbox, an implementation monitoring tool, and a comprehensive e-learning package (FAO, 2012, 2021, 2023).

## What type of guidance exists for applying EAFM to deep sea fisheries in ABNJ?

### EAF Technical Guidelines

EAF is promoted by FAO as a risk-based management planning process that accounts for issues across different dimensions of sustainable development: ecological (=environmental), human (=socio-economic), and the ability to achieve (=governance, external drivers, etc.) (Figure 1). Typically, the dsRFMOs are mandated to manage the ecological dimension that includes retained species, non-retained species and fisheries impacts more generally on the ecosystem. There have been also calls to consider more explicitly the implications of external drivers, such as climate-change and cross-sectoral interactions, with deep sea fisheries. On the other hand, the consideration of human dimensions is generally under the responsibility of individual Contracting Parties and rarely discussed at dsRFMOs meetings.

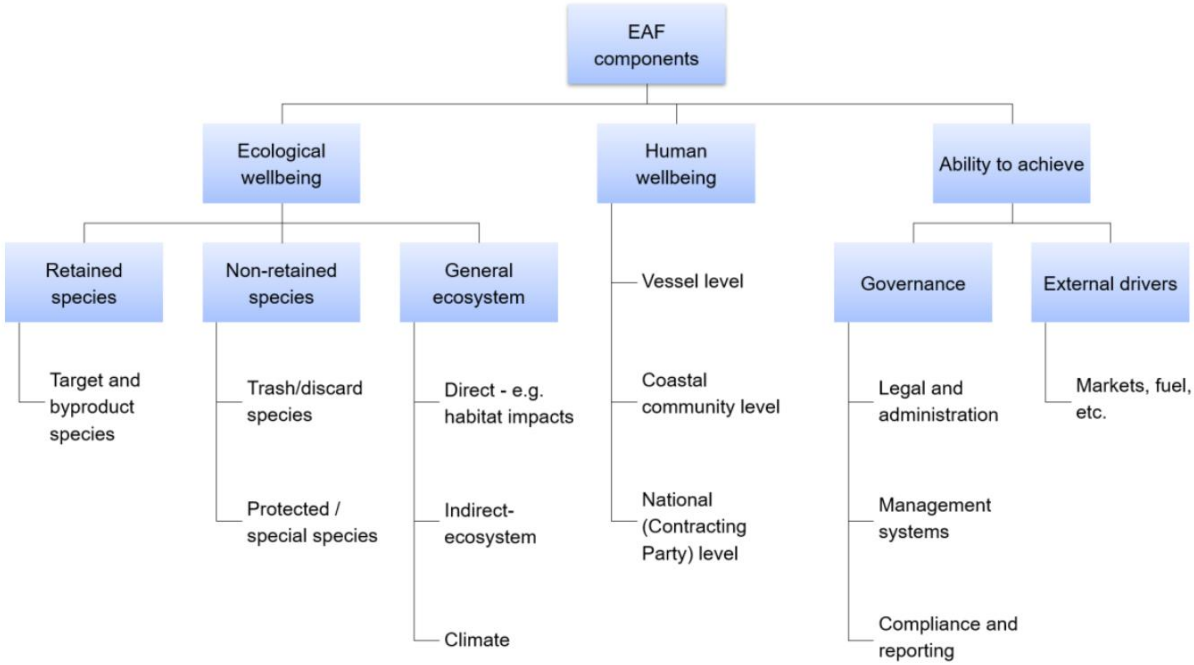


**Figure 1. The 13 key EAF components.**

Source: From Figure 2 of Fletcher (2022).

In relation to the governance dimension, the EAF Guidelines stresses the importance of stakeholder engagement which operates at two separate but overlapping levels in dsRFMOs. Engagement starts with internal national discussions to clarify and cement contracting party positions. This usually involves discussions with the fishing industry, but increasingly over the last 20 years has included biodiversity conservation and the Sustainable Development Goals (SDGs) and Global biodiversity Framework (GBF) targets. Once in force, the biodiversity beyond national jurisdiction (BBNJ) implementing agreement will also be considered, though many aspects have formed a basis for fisheries management for over a decade. These all underpin the implementation of EAF. The next level of engagement occurs at the RFMO meetings, and particularly at the decision-making Commission level. Here any national positions are translated into adopting fisheries measures for stock management (effort or catch control, etc.) and reducing impacts (gear modifications, seasonal and temporal closures, etc.). The scientific advice comes from the science committees in response to guidance from the commission.

### FAO Deep-sea Fisheries guidelines

The *International Guidelines for the Management of Deep-sea Fisheries in the High Seas* (DSF Guidelines) were developed at the request of the twenty-seventh session of the Committee on Fisheries (COFI) of FAO, in order to assist States and RFMOs in sustainably managing deep-sea fisheries and in implementing the United Nations General Assembly (UNGA) Resolution 61/105, paragraphs 76–95, concerning responsible fisheries in the marine ecosystem (FAO, 2009b). It is arranged in five sections: scope and principles, Key concepts, Governance and management, Management and conservation, and special requirements of developing states.

The DSF Guidelines were developed in accordance with the EAF and covers different dimensions outlined in Figure 1, in particular the ecological components (retained species, non-retained species, and general ecosystems) and the governance and management components (data reporting and assessment, enforcement and compliance, management measures and plans). It also notes the importance of collecting socio-economic data (e.g. catches, value of landings and employment in the harvesting and processing sectors) by States and the need to develop specific guidelines to this purpose (paragraph 33).

The greater part of the DSF Guidelines is given to the protection of vulnerable marine ecosystems from significant adverse impacts that may be caused by fishing with bottom contact gears. These are very slow-growing and structure-forming benthic habitats prone to physical damage from fishing gears and are protected typically by closures to bottom fishing gears.

The long-term sustainable management of demersal fish stocks and the reduction of bycatch is also an important part of the DSF Guidelines, and clearly falls under the EAF concept.

## What are the current gaps for implementing EAF-compatible management systems by dsRFMOs?

There have been two recent reviews of the implementation of EAFM by dsRFMOs in the ABNJ.

### Review of the implementation of EAFM by dsRFMOs

The first review by Fletcher (2020) systematically went through 13 of FAO's EAFM

components that sit within three groups (ecosystem wellbeing, human wellbeing, and ability to achieve) in a desk top study using publicly-available web-based information to assess implementation by the dsRFMOs and CCAMLR (Table 1). Among the dsRFMOs and CCAMLR, it is seen that the governance component was well covered, and the ecological component is mostly to partially covered. The top scorer within the ecosystem group related to the retained species, since this has been considered as the primary focus of the RFMO mandates as given in their conventions. The other four components in this group related to impacts, which is a more recent and growing focus of the dsRFMOs. CCAMLR's mandate covers all aspects of the ecosystem and so it covers these more directly. Climate effects were placed in two components and had low scores mainly owing to challenges in how it should be implemented. The remaining three components under consideration all had low scores and all are considered outside of the remit of the dsRFMOs. Nevertheless, these are addressed at the national level, but this was outside the scope of this review.

Fletcher found no comprehensive assessments or documentation from the available dsRFMO public information that guide their EAF implementation. Yet, his review showed that many aspects of EAF has already been covered by the dsRFMOs. He noted that the critical steps required for developing a 'compliant' EAF management plan and overall system of governance is to outline all the potential EAF-related actions and assess the risks and opportunities systematically. Such documentation provides the best basis to determine relative priorities and also what level (if any) of management intervention is required. The significant efforts that each of the dsRFMOs has already made could easily be integrated into a fully EAF-compliant system.

**Table 1. Average level of implementation of each of the EAF components by dsRFMOs.**

| Group | EAF Component | Score* |
|---|---|---|
| Ability to achieve | Compliance, reporting and review | 2.6 |
| | Management systems | 2.0 |
| | Legal and administration | 2.5 |
| | Non-environmental external drivers | 1.3 |
| Ecological wellbeing | Retained species | 2.4 |
| | Non-retained species | 2.0 |
| | "Special" species | 2.1 |
| | Direct fishing effects | 2.1 |
| | Cumulative ecosystem effects | 1.6 |
| | Climate | 1.3 |
| Human wellbeing | National social/economic | 1.0 |
| | Vessel social/economic | 0.6 |

* 1= Partly, 2 = Mostly, and 3 = Fully implemented.
Values in the Table are the average scores across the seven dsRFMOs and CCAMLR.
Source: Compiled from Figure 20 of Fletcher (2020).

He also noted that most of the dsRFMOs have delegated dealing with EAF to a science-based working group. Yet implementing the EAF approach are the responsibilities of both the managers and scientists. Adopting the EAF approach should be an overarching management strategy within each dsRFMO, and should result in the generation of clear, holistic assessments that would facilitate the development of clearly articulated and integrated long-term management plans.

**Review of the implementation of the DSF Guidelines by dsRFMOs**

The second review was by Thompson and Reid (2024) on the implementation of the DSF Guidelines. The DSF Guidelines encompass many aspects of EAF including retained species, non-retained species, and ecosystem considerations by way of the protection of vulnerable marine ecosystems. The methods of analysis were similar to those used by Fletcher but had more categories which reflected the greater operational detail in the DSF Guidelines (Table 2).

**Table 2. Average level of implementation of each of various activities in the DSF Guidelines by dsRFMOs.**

| Topic | Activity | Implementation score* |
|---|---|---|
| Monitoring, control and surveillance (MCS) | On-board observers | 40 |
| | Verification | 67 |
| | Haul level catch reporting | 67 |
| | IUU list | 100 |
| | Fishing vessel list | 100 |
| | VMS | 75 |
| Fishery assessments | Target TAC set | 85 |
| | Target biomass known | 37 |
| | Reference points and management plans | 20 |
| | Non-target bycatch limits | 37 |
| | Exploratory fishing protocol | 75 |
| | Existing bottom fishing area | 60 |
| Vulnerable Marine Ecosystems (VMEs) | Reporting encounters | 25 |
| | Threshold | 87 |
| | Avoiding SAIs | 87 |
| | VME closures | 75 |
| | Identification guide | 75 |
| | VME and SAI defined | 100 |

* Percent of dsRFMOs implementing the activity.
Source: Compiled from Figure 8 of Thompson and Reid, 2024

The conclusions support Fletcher's (2020) findings but provide a greater insight into the details of implementation. Monitoring, control and surveillance activities were well implemented, as were those activities for protecting VMEs from SAIs. This reflects the considerable effort that dsRFMOs have put into these activities, though they still have their challenges, but at least most of the control measures are in place.

The implementation of the fishery assessments is more variable and reflects the immediate objectives of managing the targeted fisheries in the short term. This is typically consistent with the scientific advice on these fisheries where there are projections over the next 2–4 years. The fish stock biomass was also known for only some of the bigger targeted stocks and reflects the difficulty in undertaking these assessments. However, it is quite possible to manage a stock sustainably without knowing the stock biomass.

Less well implemented were the use of reference points and long-term management plans; both are integral to EAF and both help guide management towards longer term objectives. Non-target bycatch limits are another aspect that requires further improvement. This includes minor species that are landed, fish species of no commercial value that are discarded, and certain vulnerable and protected groups like deepwater sharks and seabirds. Under an EAF, it is clearly important to know the total removals from the system and to set limits where appropriate for conservation purposes.

**Summary of gaps in EAFM implementation by dsRFMOs**

The dsRFMOs have implemented many aspects of EAFM that extend well beyond their normal claims of "We apply EAFM by protecting VMEs" and the like. As detailed above, EAFM includes the RFMO work on retained species for sustainable fisheries where dsRFMOs score highly. The dsRFMOs also have a well-defined governance system and MCS procedures are operational. There are some critical gaps that would help with the understanding and implementation of EAFM. These include:

General aspects

- Drafting an EAFM assessment or framework document
- Outline all EAF-related issues and associated risk assessments
- Long-term management plans and objectives
- Greater involvement of fisheries managers to guide EAFM process
- Consideration on working with dsRFMOs contracting parties on socio-economic components of EAFM

Specific aspects

- Bycatch (retained and discarded) recording and associated catch limits
- Improved risk assessments on vulnerable species
- Cumulative ecosystem effects, including from fishing and climate change
- Greater development of species specific and ecosystem indicators and reference points

## Developing guidance to address the identified gaps?

This document has presented an outline of EAFM and reviewed aspects that are well implemented by dsRFMOs and aspects that require further work. These will be further elaborated on Day 1 and Day 2 of the symposium, and this will provide various case studies that underpin the implementing EAFM.

Below are listed options for ways forward that will be further developed on Day 3 of the symposium that will examine the use of frameworks and/or roadmaps to assist RFMOs in their implementation of EAFM. We have focused on ecological aspects that fall within the remits of the dsRFMOs. Some mention should also be made to promote the application of the socio-economic elements of EAF within the Contracting Parties, and again, it is very likely that much of this already exists.

1) Scope of EAFM relevant to dsRFMOs (guided by Figure 1)
2) Fisheries and areas to be included
3) Preparation of a baseline assessment
4) Identification of issues and priorities, and associated risk assessments
5) Developing management plans, indicators and reference points
6) Holding participatory stakeholder consultations
7) Cross-sectoral links to other ocean users including the wider aspects of biodiversity conservation
8) Additional resource requirements and MCS
9) Support for socio-economic (human well-being) dimensions by Contracting Parties and how to integrate this into the work of dsRFMOs

## References

FAO. 1995. Code of Conduct for Responsible Fisheries Rome, FAO. 41p. https://www.fao.org/3/v9878e/V9878E.pdf

FAO. 2003. The ecosystem approach to fisheries. *FAO Technical Guidelines for Responsible Fisheries*. No. 4, Suppl. 2. Rome, FAO. 2003. 112 p. https://www.fao.org/3/a-y4470e.pdf

FAO. 2005. Putting into practice the ecosystem approach to fisheries. Rome, FAO. 76p.

FAO. 2008. Fisheries management. 2. The ecosystem approach to fisheries. 2.1 Best practices in ecosystem modelling for informing an ecosystem approach to fisheries. *FAO Fisheries Technical Guidelines for Responsible Fisheries.* No. 4, Suppl. 2, Add. 1. Rome, FAO. 78p. https://www.fao.org/3/a-i0151e/i0151e00.pdf

FAO. 2009a. Fisheries management. 2. The ecosystem approach to fisheries. 2.2 Human dimensions of the ecosystem approach to fisheries. *FAO Technical Guidelines for Responsible Fisheries*. No. 4, Suppl. 2, Add. 2. Rome, FAO. 88p. https://www.fao.org/3/i1146e/i1146e.pdf

FAO. 2009b. Report of the Technical Consultation on International Guidelines for the Management of Deep-sea Fisheries in the High Seas. Rome, 4–8 February and 25–29 August 2008. *FAO Fisheries and Aquaculture Report.* No. 881. Rome, FAO. https://www.fao.org/3/i0605t/i0605t.pdf

FAO. 2012. EAF Toolbox: The ecosystem approach to fisheries. Rome. 172 pp. EAF Toolbox - The ecosystem approach to fisheries (fao.org)

FAO. 2021. Ecosystem approach to fisheries implementation monitoring tool – A tool to monitor implementation of the ecosystem approach to fisheries (EAF) management. User manual. Rome. https://doi.org/10.4060/cb3669en

FAO. 2023. Ecosystem approach to fisheries: Introduction. https://elearning.fao.org/course/view.php?id=784

Fletcher, W.J. 2020. A review of the application of the FAO ecosystem approach to fisheries (EAF) management within the areas beyond national jurisdiction (ABNJ). Rome, FAO. https://www.fao.org/3/cb1509en/CB1509EN.pdf

GFCM. 2014. Agreement for the Establishment of the General Fisheries Commission for the Mediterranean. https://gfcmsitestorage.blob.core.windows.net/website/Basic%20Texts_Agreement/GFCM_Agreement-e.pdf

NEAFC. 2006. Convention on Future Multilateral Cooperation in North-East Atlantic Fisheries. https://www.neafc.org/system/files/Text-of-NEAFC-Convention-04.pdf

SPRFMO. 2022. Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean. https://sprfmo.int/assets/Basic-Documents/Convention-and-Final-Act/SPRFMO-Convention-2023-update-12May2023.pdf

Thompson, A.B. and Reid, K. 2024. Review of the implementation of the International Guidelines for the Management of Deep-sea Fisheries in the High Seas. FAO Fisheries and Aquaculture Technical Paper, No. 703. Rome, FAO. https://doi.org/10.4060/ca7692en

UNCLOS. 1982. United Nations Convention on the Law of the Sea. United Nations, New York. https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

UNFSA. 1995. 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. United Nations, New York. https://www.un.org/Depts/los/convention_agreements/texts/fish_stocks_agreement/CONF164_37.htm

WSSD. 2002. Report of the World Summit on Sustainable Development Johannesburg, South Africa, 26 August-4 September 2002. United Nations, New York. https://documents.un.org/doc/undoc/gen/n02/636/93/pdf/n0263693.pdf?token=Et52azLj37ipS2GCCd&fe=true