

OSPAR request for review of the revised nomination proforma for the 'North Atlantic current and Evlanov seabasin' MPA in the OSPAR Maritime Area

Advice summary

ICES has reviewed the revised nomination proforma for the North Atlantic Current and Evlanov Seamount Marine Protected Area (NACES MPA) and is satisfied that the issues identified in OSPAR's request are sufficiently described for the MPA to fulfil the criteria for designation set out in Appendix 1 of OSPAR Agreement 2003-17 (OSPAR, 2003).

ICES is also satisfied that the scientific case presented in revised nomination proforma for including the proposed additional features in the scope of the NACES MPA is sound.

Summary of request (full text at Annex 1)

Purpose: To carry out a peer review of the revised nomination proforma for the 'North Atlantic Current and Evlanov Sea basin MPA' (NACES MPA).

As part of the review please answer the following questions. For Questions 1 and 2 please provide a binary yes/no response and supplement with additional, explanatory comments as relevant.

- 1. Does ICES advise that based on the available data, the ecological considerations are sufficiently described to fulfil the criteria for designation?
- 2. Does ICES advise that there is a sound scientific case presented for including the proposed additional features in the scope of the NACES MPA, taking into account that OSPAR works on the best available science, applying the ecosystem-based approach to management and the precautionary principle.

In addition, ICES is requested to evaluate any new information on relevant pressures/ threats from human activities within the site as described in the nomination proforma, in particular with relation to the amended conservation objectives.

Elaboration of the Service

ICES reviewed the scientific case presented for including the proposed additional features and how these complement the original proforma and support the amended conservation objectives. The original proforma was reviewed by ICES in 2018 (ICES, 2018) and the area was protected by OSPAR in 2022 (OSPAR, 2021).

Under each of the seven OSPAR agreed criteria (OSPAR, 2003), the essential evidence supporting the inclusion of the additional features in the NACES MPA (hereafter the MPA) identified in revised nomination proforma (hereafter revised proforma) are summarised as follows:

1. **Threatened or declining species and habitats/biotopes**: Several species are mentioned to occur in the MPA that are included in the OSPAR List of Threatened and/or Declining Species and Habitats (hereafter the OSPAR List) (OSPAR, 2008) or are globally recognized as in need of protection. These include species from different parts of the ecosystem, such as whales, turtles, sharks, skates and other fish.

Details on thirteen habitats are given in the revised proforma, and three of those are listed by OSPAR as Threatened and/or Declining: seamounts and deep-sea sponge aggregations (observed) and cold-water coral gardens (modelled).

2. Important species and habitats/biotopes: High natural biological diversity with 350 species recorded in the OBIS database and >150 more listed in the literature is reported in the revised proforma. It has been shown that the MPA is important for many of these species. The revised proforma identifies the importance of the MPA for the migration and foraging of species such as fin and sei whales (*Balaenoptera physalus* and *B. borealis*), and well as several shark species.

The globally unique oceanographic features of the MPA are demonstrated as it straddles several biogeographical

areas. These, include the warm North Central Atlantic Province, Gulf Stream Province, and North Atlantic Current Province, and the cold Subarctic Atlantic Province.

There are a variety of other important habitats identified within the MPA; these include abyssal hills and plains, escarpments, fracture zones, knolls, pillow lava, ridges, and the Northwest Atlantic Mid-Ocean Channel (or Northwest Atlantic Mid-Ocean Canyon).

3. **Ecological significance**: The revised proforma provides information on key ecological processes. These support the integrity of the marine ecosystem from the sea surface to the seafloor, linking upper-ocean properties and dynamics to the ecology and biogeochemistry at the seafloor; these also include features associated with mechanisms of upward benthic-pelagic coupling at seamounts.

Although there is little in-situ empirical evidence of linkages between the ecosystem process of the three main depth zones (seamounts/knolls, pelagic and surface) across the revised MPA, deep-sea ecosystems such as seamounts are important for large pelagic organisms, which perform deep dives and use the deep ocean for feeding.

The revised proforma documents the site as being a global hotspot for mesopelagic fish (at a depth of approximately 200 to 1000m). Data confirm the likelihood that eddies of warmer water isolate mesopelagic communities from those in ambient waters and could play a key role in the food web of the MPA ecosystem. This evidence of higher productivity, and the likelihood that the higher productivity spans the different depth zones, supports the identification of the MPA as the most important pelagic foraging ground for seabirds within the OSPAR maritime Areas Beyond National Jurisdiction (ABNJ) in terms of seabird species diversity and abundance.

The revised proforma documents the seafloor's provision of feeding opportunities for migrating and deep-diving (meso-)pelagic species. Since the benthic ecosystem is fuelled by organic material sinking out of the water column, the return of organic material up the water column closes the loop and highlights the importance of an intact benthic habitat for the functioning of the ecosystem as a whole.

4. **High natural biological diversity**: Oceanographically and ecologically, the MPA is a unique site in the North-East Atlantic. It is an area of high natural biological diversity, with more than 500 species (seabirds, cetaceans, marine turtles, fish, cephalopods, benthic invertebrates, phytoplankton, zooplankton and mixoplankton) identified in the MPA.

Ten species of marine mammals have been identified in the area; these include two OSPAR listed species, blue whale (*Balaenoptera musculus*) and harbour porpoise (*Phocoena phocoena*), that have been tracked in and around the MPA. The revised proforma list five marine turtle species that occur in the area, including two OSPAR-listed species. The MPA is a known hotspot for mesopelagic fish, with >100 species recorded and hosts a high diversity of cephalopods.

Thirteen habitat types have been observed or modelled, including abyssal plains, abyssal hills, basins, fracture zones, pillow lava, knolls, seamounts, deep-sea sponge aggregations and coral gardens. Two of those habitat types are listed as threatened and/or declined, and they have been observed in the MPA: seamounts (>30), and deep-sea sponge aggregations

- 5. **Representativity**: Deep-sea benthos, the ecological and the biochemical processes that take place across the MPA are representative of other deep ocean floor habitats of the Atlantic Ocean. Seamounts, deep-sea sponge aggregations and coral gardens in the MPA are good examples of these habitats. Water column, physical, chemical and biological oceanographic processes are representative of those found across the mid and deep North Atlantic. General pelagic biology and ecology within the MPA is representative of the other deeper areas of the North Atlantic.
- 6. **Sensitivity**: The high proportion of OSPAR listed species recorded is evidence of the MPA's sensitivity. Basking sharks (*Cetorhinus maximus*) are vulnerable to incidental by-catch and risks of collisions with vessels. Cetaceans are sensitive to underwater noise from, for example, military naval sonars, seismic exploration, deep-sea mining

and shipping noise. Odontocete cetaceans are particularly threatened by entanglement in gear and by sub-lethal injuries or mortality from hooks. The latter may occur during depredation events, when cetaceans take prey from baited longlines. Leatherback turtles (*Dermochelys coriacea*) in the MPA are sensitive to shipping, bycatch, and plastic ingestion.

Threatened and declined habitats i.e., seamounts with associated cold-water corals, and deep-sea sponge aggregations, are vulnerable to physical disturbance from human activities such as bottom fishing and mining should these occur in the area.

7. **Naturalness:** The MPA has a high degree of naturalness, due primarily to its remoteness and depth. The MPA is not assumed to be pristine, as shipping and pelagic fishing take place within and around the MPA. Major shipping lines between north America and Europe pass through the MPA, mainly its southern part.

Fishing effort is low in comparison with adjacent areas, and there is no bottom-fishing effort. The other main pressure is pollution primarily by micro plastics. Mesopelagic fish, located in and near the MPA, were found to contain microplastics in their guts and water samples collected from depths of 2000m also contained micro plastics. There are no known exploration or exploitation plans at the MPA as of yet.

Review

ICES Response to Question 1.

ICES reviewed the revised proforma for the North Atlantic Current and Evlanov Seamount marine protected area (MPA) and is satisfied that the issues identified in OSPAR's request are sufficiently described for the MPA to fulfil the criteria for designation set out in Appendix 1 of OSPAR Agreement 2003-17.

a) Based on the available data, is the role of the benthic ecosystems and biodiversity of the seabed, ocean floor and subsoil thereof of the NACES MPA in supporting the pelagic ecosystem, seabirds and other OSPAR listed species identified sufficiently described to fulfil the criteria for designation?

The revised proforma provides information on key ecological processes supporting the integrity of the marine ecosystem from the sea surface to the seafloor. A large body of scientific research explicitly links upper-ocean properties and dynamics to the topography, ecology and biogeochemistry at the seafloor. These include features associated with mechanisms of upward benthic-pelagic coupling at seamounts, see section 1b below.

The revised proforma documents that *in situ* studies highlight the MPA to be a global hotspot for mesopelagic fish (at depths of approximately 200 to 1000m). Higher densities of these organisms are found to be related to warm temperatures. Data confirms the likelihood that eddies isolate mesopelagic communities from those in ambient waters and could play a key role in the food web of the MPA ecosystem. This is evidence of the MPA's high productivity and the likelihood that the higher productivity spans the different depth zones supporting the MPA identification as most important pelagic foraging ground for seabirds within the ABNJ of the OSPAR maritime area in terms of seabird species diversity and abundance. Specifically, the MPA is an important foraging ground for the OSPAR List species black-legged kittiwake (*Rissa tridactyla*), thick-billed murre (*Uria lomvia*) and Audubon's shearwater (*Puffinus lherminieri baroli*). Since IBAs' (Important Bird Areas) locations are correlated with areas of importance for other species and habitats, the role of seabirds as 'umbrella species' indicate that the MPA is a highly productive marine ecosystem that also supports many other taxa.

A wide range of other pelagic mobile marine species including cetaceans, marine turtles, tuna, and oceanic sharks, occurs in the site, and for some of these species the MPA represents a critical node in their ranges and migrations. Tracking studies show, for example, long-range horizontal movements of blue whale (*Balaenoptera musculus*), sei whale (*Balaenoptera borealis*), fin whale (*Balaenoptera physalus*), leatherback turtle (*Dermochelys coriacea*), Atlantic Bluefin tuna (*Thunnus thynnus*) and basking shark (*Cetorhinus maximus*) in the MPA area. These organisms are known to perform deep dives and use the mesopelagic zone as well as the deep ocean for feeding.

The seafloor at the MPA is characterized by large variation encompassing abyssal plain, hills, knolls and seamounts, spanning a large depth range. This high-variability abiotic patchwork gives rise to and is inhabited by a large diversity of deep-sea taxa. This provides potential opportunities for migrating and deep-diving (meso-) pelagic species, to feed on, for example, on the pelagic larval stages of benthic macroinvertebrates and fish. Since the benthic ecosystem is fuelled by organic material sinking out of the water column, the return of organic material up the water column closes the loop and highlights the importance of an intact benthic habitats for the functioning of the ecosystem as a whole.

b) Based on the available data, is the distribution, extent and condition of specific OSPAR listed habitats such as seamounts, at the site and the role of the associated biodiversity and ecosystem processes and trophic linkages in supporting the pelagic ecosystem, seabirds and other OSPAR listed species sufficiently described to fulfil the criteria for designation?

The distribution and extent of OSPAR List benthic habitats across the MPA is described in the revised proforma. Seamounts are predominantly located in the south-west of the area, with "knolls" predominantly to the northern and eastern parts of the MPA. Their true condition is generally unknown due to depth (approximately 2000 to 4000 m) and remoteness limiting sampling and observation opportunities. They may be assumed to be in good condition due to this remoteness and depth. Presence, extent and processes of benthic habitats and demersal species are based on observations from bathymetric and multibeam surveys, *in-situ* studies and modelling. Thirteen habitats are described in the report, of which three occur on the OSPAR List: seamounts and deep-sea sponge aggregations (observed), and cold-water coral gardens (modelled).

Deep-sea sponge aggregations, seamount habitats and cold-water coral gardens are associated with high biological diversity. Demersal fish, cephalopods and the eggs of deep-sea skates or sharks have been observed. These are indicative of tertiary ecosystem processes. Understanding of deep-sea ecosystem processes has grown over the past two decades, with many benthic assemblages and linkages among trophic levels established. Reef-building, deep-water corals and black corals are indicator species of vulnerable marine ecosystems (VMEs).

Deep-sea ecosystems such as seamounts are important for large pelagic organisms such as cetaceans and sharks, which perform deep dives and use the deep ocean for feeding. While there is little empirical evidence of linkages between seamounts/knolls, pelagic and surface ecosystem processes across the MPA, the pelagic ecosystem is supported by the complex oceanography and is an important transition zone where large oceanic gyres occur and interact. Mechanisms of water flow around seamount and knolls, and associated sea-surface productivity may be expected. Taylor column and Taylor cap fluid dynamics are associated with high surface productivity. Biological mechanisms will support upward transport of organic material produced at the seafloor, including release of free-flowing larval stages of benthic fish and invertebrates. While seafloor ecosystems are likely fuelled by organic matter sinking down from the pelagic zone, it is unlikely that they provide nutrients or organic material to the pelagic zone in meaningful quantities. The presence of seafloor seamounts/knolls, however, has been linked with observations of diverse sea-surface diversity; this is likely to come about through oceanography actions attracting deep pelagic, pelagic and deep diving cetaceans to these areas.

c) Based on the available data is the distribution and abundance of specific OSPAR listed species, such as deepsea sharks, at the Site and the role of the biodiversity, ecosystem processes and trophic linkages at the Site in supporting them are sufficiently described to fulfil the criteria for designation?

and

d) Based on the available data, is the importance and ecological significance of the NACES MPA to additional relevant species and habitats included on the OSPAR List of Threatened and/or declining species and habitats, such as Seamounts, Blue whale (Balaenoptera musculus), Leatherback turtle (Dermochelys coriacea), Bluefin tuna (Thunnus thynnus) and Basking Shark (Cetorhinus maximus), Deep sea shark species sufficiently described to fulfil the criteria for designation?

Joint comments to question 1c) and 1d)

The revised proforma considers information on several species and habitats (including biogenic habitats) some of which are contained on the OSPAR List or otherwise considered as important. These include cetaceans, marine turtles, pelagic sharks and large pelagic fish.

The MPA was originally proposed to protect seabird species. The high productivity of this site, however, also creates a foraging hotspot for other high trophic-level consumers including cetaceans, oceanic sharks, and large pelagic fish. Warm-core eddies are hotspots for mesopelagic fish and cephalopods, which are important prey for seabirds, marine turtles, whales, and sharks.

Several species of marine mammals have been identified in the area; these include two OSPAR listed species (OSPAR, 2008); blue whale *Balaenoptera musculus* and harbour porpoise (*Phocoena phocoena*)). The area seems not be of major importance for harbour porpoise.

The revised proforma list 5 marine turtle species that occur in the area, including two OSPAR-listed species; the loggerhead turtle (*Caretta caretta*) and the leatherback turtle (*Dermochelys coriacea*).

Available data show that the MPA is a critical foraging habitat for OSPAR-listed fish species, with abundant prey available fort Bluefin tuna (*Thunnus thynnus*). Basking shark (*Cetorhinus maximus*), has also been tracked inside the MPA. These organisms can perform important deep dives to forage on organisms. There is some evidence of the MPA being on the pathway of eel larvae migrating from the Sargasso Sea to coastal Europe. Eel is on the OSPAR List, but not for OSPAR Region V.

No deep-sea shark species are mentioned in the revised proforma.

The occurrence of OSPAR-listed habitats, coral gardens and deep-sea sponges, are inferred from habitat suitability modelling. Deep-sea sponges were reported on one survey but no deep-sea corals.

e) Based on the available data, are the features other than OSPAR listed features for which the area is important, sufficiently described to fulfil the criteria for designation?

The MPA is an area of high natural biological diversity, with 350 species recorded in the OBIS database and >150 more listed in the literature.

The site is a seasonal feeding location for several species, most likely due to the high abundances of zooplankton, schooling fish and other micronekton. The MPA is an important habitat related to migration and foraging for fin and sei whales (*Balaenoptera physalus* and *B. borealis*), for example, and in all likelihood also for blue shark (*Prionace glauca*), tiger shark (*Galeocerdo cuvier*), white shark (*Carcharodon carcharias*) and shortfin mako shark (*Isurus oxyrinchus*).

Other species of ecological significance for the MPA include the following: additional cetaceans (whales and dolphins), other marine turtles, cephalopods (squids and octopuses), fish species (such as sharks, rays, skates, pelagic fish, and mesopelagic fish), gelatinous zooplankton (such as medusae, tunicates, and salps), and micro- and mesozooplankton species.

Other habitats of ecological interest include abyssal hills and plains, escarpments, fracture zones, knolls, pillow lava, ridges, and the Northwest Atlantic Mid-Ocean Channel (or Northwest Atlantic Mid-Ocean Canyon).

f) Based on the available data, is the capacity for carbon sequestration and storage sufficiently described to fulfil the criteria for designation?

Carbon sequestration is not put forward as justification for extending the MPA. Some limited evidence for the particular importance of this site was highlighted in the revised proforma. As carbon sequestration and storage does not necessarily

align with the designation criteria provided in OSPAR Agreement 2003-17, this aspect is difficult to evaluate against these criteria. Carbon sequestration (taken to include storage) at this site supports the MPA selection criteria "Representativity" in this function, as well as "Ecological significance" and "High natural biological diversity", both criteria supporting the nomination.

The documentation provides information about the capacity for carbon sequestration and storage of some of the organisms found at the MPA. Many of the higher-level taxa found at the Site are predators with longer generation times, these can retain biomass and nutrients in mid- and high-trophic levels and reduce the turnover of biogenic carbon often concentrated in lower trophic levels.

Carbon sequestration in the MPA is promoted by, *inter alia*, high primary production and vertical migrators that transport carbon to depth. The MPA is a hotspot for mesopelagic fish and hosts a high abundance of gelatinous zooplankton, both important sources of carbon. Vertical mixing of nutrients contributes to high primary productivity. Diel vertical migrations by zooplankton and mesopelagic fish contribute to downward carbon flux. Some gelatinous zooplankton species have few predators and are considered trophic dead ends. Such species also sink out of the photic zone and play a major role in carbon sequestration. This form of downward carbon flux is expected to be more pronounced at the MPA than elsewhere in the North Atlantic. Habitat forming species can also play a role in carbon sequestration and storage.

ICES Response to Question 2.

Is a sound scientific case presented for including the proposed additional features in the scope of the NACES MPA, taking into account that OSPAR works on the best available science, applying the ecosystem-based approach to management and the precautionary principle.

ICES is satisfied that the scientific case presented for including the proposed additional features in the scope of the NACES MPA is sound.

The revised proforma describes the important role of additional species and benthic habitats within the MPA. ICES notes the implicit ecological value these additional species and benthic habitats have in their own right, as well as how they also fulfil the criteria for OSPAR MPA designation.

While explicit scientific linkages between seafloor seamount/knoll habitats and surface ecosystem productivity and processes are not fully understood, and many seafloor habitats have not been directly observed, their linkages and importance to surface activity has been observed and documented in the revised proforma.

ICES concludes that there is substantial evidence of the presence of vulnerable marine ecosystems, such as seamounts and deepsea sponge aggregations, presented in the MPA to warrant extension of the MPA's scope to include the protection of benthic ecosystems.

ICES Response for Additional information.

Evaluation of new information on relevant pressures/ threats from human activities within the site as described in the nomination proforma, in particular with relation to the amended conservation objectives. (i.e. consequences for ecosystem function and support to seabird populations at The Site).

The general area has a high degree of naturalness, with species and habitats/biotope types still assumed to be in a very natural state as a result of the lack of recent human-induced disturbance or degradation. The revised proforma provides information about relevant pressures from human activities, the management of which can be important for the success of the conservation objectives of the MPA.

The main three human activities mentioned in the documentation are (a) pollution (mostly by micro plastics), (b) fishing mortality and by-catch, and (c) nuisance and mortality associated with shipping/transport routes. The three pressures are identified, defined and assessed in general terms.

The revised proforma summarises the main threats to each OSPAR listed species and other species groups. Shipping lanes between Europe and North American cross through the southern part of the MPA. Baleen whales are especially sensitive to underwater noise from shipping and military sonars (activities occurring at the site) and from seismic exploration and deep seabed mining (activities presently not occurring at the site). Whales are especially vulnerable if the zone of influence of such activities coincides with feeding or breeding areas and with migratory corridors. Exploration or deep-sea mining also affect benthic habitats.

There are no known exploration or exploitation plans at the site as of yet.

Microplastic debris is pervasive in the world ocean.

Pelagic fishing takes place; the most common gear type is drifting longlines. Fishing effort is low compared with adjacent areas outside the MPA. There is no bottom-fishing effort.

The listing of potential threats is precautionary in the sense that these threats to the same species have been documented in other areas but do not yet occur (or occur at low levels) in the MPA. Low current threat levels confer a high degree of naturalness on the MPA. As such, recent and planned surveys of the MPA will measure baseline conditions.

Background

The OSPAR Commission designated the North Atlantic Current and Evlanov Sea Basin MPA in 2021 for protecting and conserving seabirds and the ecosystems of the waters suprajacent to the seabed. As part of the designation, OSPAR agreed to develop a roadmap to re-evaluate the case for broadening the conservation objectives of the NACES MPA and the scope of the OSPAR Decision on the delineation of the MPA.

The result is a revised nomination proforma that includes new evidence on the case for the inclusion of the seabed, ocean floor and subsoil and additional species and habitats.

The revised NACES revised nomination proforma is available as a PDF file for public consultation (OSPAR, 2022).

Basis of the advice

This review is prepared by ICES expertise within the ICES advisory process (ICES, 2023) and is based on the revised nomination proforma and the view of three scientific experts who independently reviewed the revised proforma against the questions posed by OSPAR.

The ecological criteria for designation used by ICES to evaluate the revised proforma are set out in Appendix 1 of OSPAR Agreement 2003-17 on Guidelines for the Identification and Selection of Marine Protected Areas in the OSPAR Maritime Area (OSPAR, 2003). The seven criteria are 1) Threatened or declining species and habitats/biotopes, 2) Important species and habitats/biotopes, 3) Ecological significance, 4) High natural biological diversity, 5) Representativity, 6) Sensitivity, and 7) Naturalness. The guideline specifies that an area qualifies for selection as an MPA if it meets several, but not necessarily all, of these criteria.

Sources and references

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Recommended citation: ICES. 2023. OSPAR request for review of the revised nomination proforma for the 'North Atlantic current and Evlanov seabasin' MPA in the OSPAR Maritime Area. *In* Report of the ICES Advisory Committee, 2023. ICES Advice 2023, sr.2023.02, https://doi.org/10.17895/ices.advice.22153610

Annex 1: Full text of OSPAR Request

Purpose: To carry out a peer review of the revised nomination proforma for the 'North Atlantic Current and Evlanov Sea basin MPA' (NACES MPA, the Site).

As part of the review please answer the following questions. For Questions 1 and 2 please provide a binary yes/ no response and supplement with additional, explanatory comments as relevant.

- 1. Referring to The Proforma, Section B; part a 1-7 (ecological considerations) and associated annexes. Does ICES advise that based on the available data, the following issues are sufficiently described to fulfil the criteria for designation?
 - a. the role of the benthic ecosystems and biodiversity of the seabed, ocean floor and subsoil thereof of the NACES MPA in supporting the pelagic ecosystem, seabirds and other OSPAR listed species identified;
 - b. the distribution, extent and condition of specific OSPAR listed habitats such as seamounts, at the site and the role of the associated biodiversity and ecosystem processes and trophic linkages in supporting the pelagic ecosystem, seabirds and other OSPAR listed species;
 - *c.* the distribution and abundance of specific OSPAR listed species, such as deep-sea sharks, at the Site and the role of the biodiversity, ecosystem processes and trophic linkages at the Site in supporting them;
 - d. the importance and ecological significance of the NACES MPA to additional relevant species and habitats included on the OSPAR List of Threatened and/or declining species and habitats, such as Seamounts, Blue whale (*Balaenoptera musculus*), Leatherback turtle (*Dermochelys coriacea*), Bluefin tuna (*Thunnus thynnus*) and Basking Shark (*Cetorhinus maximus*), Deep sea shark species;
 - e. in terms of features other than OSPAR listed features for which the area is important;
 - f. capacity for carbon sequestration and storage.
- 2. Does ICES advise that there is a sound scientific case presented for including the proposed additional features in the scope of the NACES MPA, taking into account that OSPAR works on the best available science, applying the ecosystem-based approach to management and the precautionary principle.

In addition, ICES is requested to evaluate any new information on relevant pressures/ threats from human activities within the site as described in the nomination proforma, in particular with relation to the amended conservation objectives. (i.e. consequences for ecosystem function and support to seabird populations at The Site).