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6.5. Mediterranean Offshore Guidelines and Standards: Draft Common Standards and Guidelines for Special Restrictions or Conditions for Specially Protected Areas (SPAs) within the framework of the Mediterranean Offshore Action Plan

Rationale for the Common Standards and Guidelines for Special Restrictions or Conditions for Specially Protected Areas (SPA) within the Framework of the Mediterranean Offshore Action Plan

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List of Abbreviations / Acronyms

BOEM	Bureau of Ocean Management (US)
BSEE	Bureau of Safety and Environmental Enforcement (US)
BWM Convention	Ballast Water Management Convention
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
DECC	Department of Energy and Climate Change (UK)
DFO	Department of Fisheries and Oceans (Canada)
EcAp	Ecosystem approach
EFH	Essential fish habitats
EIA	Environmental Impact Assessment
FRA	Fisheries Restricted Areas
GIS	Geographic Information System
GFCM	General Fisheries Commission for the Mediterranean
GoM	Gulf of Mexico
HMCS	Harmonised Mandatory Control System
HELCOM	Baltic Marine Environment Protection Commission (Helsinki Commission)
IFC	International Finance Corporation
IMAP	Integrated Monitoring and Assessment Programme (Mediterranean)
IMO	International Maritime Organization
IOGP	International Association of Oil and Gas Producers
IPIECA	International Petroleum Industry Environmental Conservation Association
IUCN	International Union for Conservation of Nature
JAMP	Joint Assessment and Monitoring Programmes

JNCC	Joint Nature Conservation Committee (UK government advisory body)
MARPOL	International Convention for the Prevention of Pollution from Ships
MEPC	Marine Environment Protection Committee (part of the IMO)
MPA	Marine Protected Area
NTL	Notice to Lessees and Operators
OFOG	Offshore Oil and Gas sub-group
OSPAR	Convention for the Protection of the Marine Environment of the North-east Atlantic. (Oslo Paris Commission)
PAM	Passive acoustic monitoring
PERSGA	Programme for the Red Sea and Gulf of Aden
PSSA	Particularly Sensitive Sea Area
RAC	Regional Activity Centre
ROV	Remotely-operated vehicle
SAP BIO	Strategic Action Plan for the Conservation of Biological Diversity
SPA	Specially Protected Areas
SPAMI	Specially Protected Area of Mediterranean Importance
UNCLOS	United Nations Convention on the Law of the Sea

Chapter 1: Background

1.1 Project Aims and Objectives

1. The aim of this project is to define common standards and guidelines relating to special measures and conditions for specially protected areas within the framework of the Mediterranean Offshore Action Plan and to inform uptake and implementation of agreed guidelines by Contracting Parties to the Barcelona Convention. This has been achieved through the following objectives:

- Establish the presence of existing and planned specially protected areas;
- Review of questionnaire responses to the relevant regional Competent Authority (Regional Activity Centre/Specially Protected Areas (SPA/RAC)) on existing standards and guidelines on special restrictions and conditions for specially protected areas;
- Review publicly available documentation and best practice relating to offshore exploration and exploitation activities.

1.2 Methodology and the Rationale of the Proposed Standards and Guidelines

2. Specific recommendations for specially protected areas will need to be based on a sound understanding of the locations, status and biological characteristics of existing and planned specially protected areas in the Mediterranean. To this end, a detailed questionnaire was provided to SPA/RAC requesting information on these areas including, the organisations with responsibility for the implementation of management measures and key biological features with particular reference to turtles, Monk seals and cetaceans, and important marine habitats such as sandbanks, sea grass beds, biogenic and stony reefs, pockmarks and chemosynthetic communities, diapirs, deep-sea sponge aggregations and other habitats. This information is partly available in GIS format through the Mediterranean Platform on Biodiversity (<http://data.medchm.net/en/>). It should be noted however that the information on the Mediterranean Platform on Biodiversity is not (yet) complete and will require to be developed further by adding more relevant meta data (such as the parameters described above).

3. Considering the biological characteristics of specially protected areas in the Mediterranean Sea, a review of publicly available standards and guidelines on relevant mitigation measures has been undertaken. A focus has been on establishing measures used within the offshore oil and gas industry, given the objectives of the Offshore Protocol, although accepted mitigation adopted to ameliorate adverse impacts of activities of other industries, such as offshore renewables and marine aggregate extraction, have been described where relevant. The guidelines reviewed here are not necessarily related to specially protected areas but aim to be relevant to valued species and habitats in their respective jurisdictions and to their Mediterranean analogues.

4. Recommendations presented in the detailed review of international best practices (REMPEC/WG.35/INF.3) called for (i) specially protected areas to be documented, (ii) special provisions for activities in specially protected areas to be determined and (iii) guidance for operators specifying special provisions for activities in specially protected areas to be developed in line with Article 21 of the Offshore protocol. The recognised need for common standards and guidelines together with the outcomes of the review of international best practice provide the rationale for this study.

1.2.1 Literature Review

5. The study of international best practice and regulations relevant to the implementation of the Offshore Protocol has been reviewed as part of the study. This highlights the recommendations for the development of guidance, as mentioned above, and summarises the general guidance available with regard to specially protected areas.
6. National guidelines have been collated, primarily from web searches, and summarised. Where relevant, industry knowledge on general working practices has been applied. In addition, information from other conventions, such as OSPAR and HELCOM has been drawn upon.
7. The SPA/RAC website provides information on SPAMIs and background information on the SPA/BD Protocol as well as the presence of threatened species and habitats.

1.2.2 Consultation With SPA/RAC

8. The Mediterranean Biodiversity Platform (<http://data.medchm.net/en/>) has been developed by SPA/RAC and provides an online repository of biodiversity information for the Mediterranean, including habitat maps, for example. However, it should be noted that the data provided on specially protected areas is currently limited only to information on the identities and geographical boundaries of the SPAs and it is recommended that the facility continues to be developed and updated including the features for which each protected site has been designated.

1.3 Legislative Framework

1.3.1 Article 21 of the Offshore Protocol - Specially Protected Areas

9. The Offshore Protocol adopted in 1994, which is one of seven protocols arising from the Barcelona Convention came into force on 24th March 2011. It addresses in particular Article 7 of the Barcelona Convention, which states that ‘*Contracting Parties shall take all appropriate measures to prevent, abate, combat and to the fullest extent possible eliminate pollution of the Mediterranean Sea Areas resulting from exploration and exploitation of the continental shelf and the seabed and its subsoil.*’ The Protocol encompasses a wide range of exploration and exploitation activities within six main sections covering key issues such as the authorisation system, wastes and harmful or noxious substances and materials, safeguards and cross-party cooperation. Section IV deals with safeguards and provides for *inter alia*, monitoring, contingency planning and specially protected areas.
10. Article 21 within Section IV of the Offshore Protocol refers to Mediterranean Specially Protected Areas and requires Contracting Parties to take special measures in conformity with international law, either uni- or multi-laterally to prevent pollution in these areas through the imposition of conditions or restrictions as part of the granting of authorisations of activities in these areas. Appropriate measures that could be taken are not specifically spelt out in the Protocol but include, and are defined as, restrictions or conditions when granting authorisations for specially protected areas, considering (i) the preparation and evaluation of EIAs and (ii) the elaboration of measures in specially protected areas for the monitoring, removal of installations and prohibition of discharges, and also as the exchange of information between Parties, operators and competent authorities on matters which

relate to specially protected areas. These measures are in addition to those provided for in the Protocol on Specially Protected Areas (see Section 1.3.3, below).

1.3.2 The Mediterranean Offshore Action Plan

11. The Mediterranean Offshore Action Plan seeks to, *inter alia*, define commonly agreed regional offshore standards and guidelines to be integrated and used at national level. It enables the Offshore Protocol, in part, by providing for measures '*which if applied at regional level and by each Contracting Party within their jurisdiction will ensure the safety of offshore activities and reduce their potential impact on the marine environment and its ecosystem*'. As a general objective, the Action Plan requires these measures to define commonly agreed regional offshore standards and guidelines and for these to be integrated and used at national level.

12. As well as general objectives, a number of specific objectives are also laid out in the Mediterranean Offshore Action Plan which, if achieved, will meet the general objectives. One of the specific objectives is the establishment of a specialist Offshore Oil and Gas (OFOG) sub-group on environmental impact to deal with, amongst other matters, precautions for specially protected areas. The purpose of the sub group in this instance is to implement the technical and practical aspects of the Action Plan with particular focus on the development of the required standards and guidelines including delivery of the special restrictions or conditions for specially protected areas.

13. It should be noted that the Contracting Parties agreed when adopting the Mediterranean Offshore Action Plan that the discharge and disposal of machinery oil, the treatment and discharge of sewage (Article 11 of the Offshore Protocol), the disposal and discharge of garbage (Article 12 of the Offshore Protocol), the reception facilities (Article 13 of the Offshore Protocol) and the ship storage shall be regulated according to the requirements listed under the relevant Annexes of the International Convention for the Prevention of Pollution from Ships (MARPOL).

1.3.3 Article 6 of the Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD) Protocol - Protection Measures

14. The Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD) also arose from the Barcelona Convention. It was adopted in 1995 and came into force in 1999. It aims to protect natural resources, biodiversity and cultural heritage aspects of the Mediterranean through the establishment of specially protected areas and, together with the Strategic Action Plan for the Conservation of Biological Diversity in the Mediterranean (SAP BIO), is the main instrument for implementing the 1992 Convention on Biological Diversity (CBD) in the Mediterranean.

15. The SPA/BD Protocol provides for the establishment and protection of specially protected areas, the listing of specially protected areas of Mediterranean importance (SPAMI) and conservation of species. Articles 4 and 5 describe the characteristics by which specially protected areas may be selected and the methods for establishing these areas, respectively.

16. Article 6 of the SPA/BD Protocol lays out the protection measures required in relation to Specially Protected Areas and which relate to (i) the strengthening of the application of the other

1.3.5 Marine Protected Areas (MPA) and Fisheries Restricted Areas (FRA)

19. In addition to SPAMIs, numerous other marine and coastal sites have been designated for nature conservation in the Mediterranean. Collectively they are referred to as Marine Protected Areas (MPAs). Gabrié et al (2012) inventoried a total of 677 MPAs in the Mediterranean which included 161 sites with nationally designations, 9 sites with an international designation and 507 Natura 2000 sites (comprising sites designated under the EU Birds Directive and EU Habitats Directive). The Mediterranean also supports 5 Biosphere Reserves and 2 World Heritage sites. Information on Mediterranean MPAs are collated by the MAPAMED GIS database(<http://medpan.org>) as well as the SPA/RAC Mediterranean Platform on Biodiversity (<http://data.medchm.net/en/>).

20. Seven areas have also been designated by the General Fisheries Commission for the Mediterranean (GFCM) as Fisheries Restricted Areas (FRAs) within which management measures that regulate or restrict fishing activities through closures or prohibiting certain types of fishing gears have been adopted (<http://www.fao.org/gfcm/en/>). GFCM has also prohibited bottom trawling in depths greater than 1000 m. The purpose of the management measures imposed is to protect sensitive deep sea benthic habitats and essential fish habitat.

1.3.6 International Convention for the Prevention of Pollution from Ships (MARPOL)

21. As a specialized agency of the United Nations, IMO is the global standard-setting authority for the safety, security and environmental performance of international shipping. Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented. Conventions, rules and regulations adopted under the aegis of the IMO provide international legal framework and practices for protecting the marine environment.

22. In this context, the International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocols of 1978 and 1997 relating thereto (MARPOL) and its Annexes, is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes. The Annexes address the measures needed to prevent different aspects of pollution including oil (Annex I), noxious liquid substances (Annex II), harmful substances in packaged form (Annex III), sewage (Annex IV), garbage (Annex V) and air pollution (Annex VI). Special Areas with strict controls on operational discharges are included in most Annexes.

23. The work of the IMO's Marine Environment Protection Committee (MEPC) has relevance to the development of restrictive and control measures for Specially Protected Areas and, for the purposes of Annexes I and V, have themselves designated the Mediterranean Sea as one of several "Special Areas" for which, owing to their oceanographic and ecological condition, mandatory methods for the prevention of marine pollution are required. Preventative methods adopted under MARPOL include limits on the amount and concentrations of oily and bilge water discharges depending on vessel size (gross tonnage) and the water processing that has occurred. Specially Protected Areas in the Mediterranean thus already receive some inherent protection from the shipping of hydrocarbons through the MARPOL provisions. Further to this, the MEPC has also identified "Particularly Sensitive Sea

Areas” (PSSAs) which recognise an area’s significant natural and cultural heritage, scientific and/or socio-economic attributes for which specific IMO action may be required to prevent damage. In the Mediterranean, the Strait of Bonifacio (separating Corsica and Sardinia) is designated as a PSSA for its outstanding biodiversity. Controls have been adopted into French and Italian law to prevent pollution of this area and include the banning of ships carrying petroleum products and noxious substances from transiting the straits and the strict regulation of navigation of vessels.

1.3.7 International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM)

24. Over the past two decades, ships’ ballast water has been recognized as one of the major vectors for the introduction of harmful aquatic organisms and pathogens into the aquatic environment and the introduction of invasive species was recognised as one of the four biggest threats to the marine environment.

25. IMO’s activities to address this issue have included the development of guidelines and of a regulatory regime – culminating in the adoption of the International Convention for the Control and Management of Ships’ Ballast Water and Sediments (BWM Convention) in February 2004, which came into force in September 2017. and which aims to prevent the spread of harmful aquatic organisms by establishing standards and procedures for the management of ship’s ballast waters and sediments. All ships are required to manage ballast water according to a specific ship management plan and should carry a record book and international certificate. It is expected that the standards will be gradually phased in over time but as an interim measure and before ballast water treatment systems are installed, ships are required to exchange ballast water mid-ocean.

26. The Seventeenth Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols (COP 17), which was convened in Paris, France from 8 to 10 February 2012, adopted the Mediterranean Strategy on Ships’ Ballast Water Management, including its Action Plan and Timetable (hereinafter referred to as the Mediterranean BWM Strategy) as well as the “General Guidance on the Voluntary Application of the D1 Ballast Water Exchange Standard by Vessels Operating between the Mediterranean Sea and the North-East Atlantic and/or the Baltic Sea” (UNEP(DEPI)/MED IG.20/8, Decision IG.20/11). The Mediterranean BWM Strategy is the result of the work of the Mediterranean Regional Task Force and of its Focus Groups, which were established in September 2008 with the mandate to develop a Strategic Action Plan for the region. The Regional Task Force, composed of all the Contracting Parties to the Barcelona Convention and coordinated by REMPEC, was assisted in its work by IMO and SPA/RAC. The general objective of the Mediterranean BWM Strategy is to establish the framework for a regional harmonised approach in the Mediterranean on ships’ ballast water control and management which is consistent with the requirements and standards of the BWM Convention, as outlined in its Article 13.3.

Chapter 2: Overview of Established and Planned Specially Protected Areas (SPAs) and Features in the Mediterranean

27. There are 34 designated SPAMIs and well in excess of 600 marine protected areas in the Mediterranean Sea. A list of current SPAMIs is presented on the SPA/RAC website (<http://www.rac-spa.org/spami>).

28. The Mediterranean Sea supports a high biodiversity. It is calculated that it supports 6% of the world biodiversity for 1% of the of the world's ocean surface area and 0.3% of its volume (UNEP-MAP-SPA/RAC (2010). Endemism is also comparatively high, and a high proportion of species present within the Mediterranean are not found anywhere else.

29. Many species present are regarded as at low population levels and are listed on the IUCN Red List as being Endangered, Threatened and Vulnerable. Some species like the Mediterranean Monk seal is listed as Critically Endangered. Particular threats to marine life in the Mediterranean relate to increasing human populations along coastal zones and associated pressures from fishing, pollution, noise and spread of non-native species as well as climate change, resulting in habitat degradation and loss and behavioural changes in species.

30. The establishment of specially protected areas is an important tool for the protection of valued and threatened biological features. This chapter summarises the locations of specially protected areas of Mediterranean Importance and the criteria by which they are selected.

2.1 Designation Criteria

31. Article 3 of the SPA/BD protocol mandates Contracting Parties to the protection, preservation and management of areas of particular natural and cultural heritage value through the establishment of specially protected areas and lists the obligations associated with achieving this. Article 4 lays out the objects of specially protected areas which, in summary, include the safeguarding of

- Representative types of coastal and marine ecosystems;
- Habitats which are in danger of disappearing;
- Habitats that are critical to the life stages of threatened, endangered or endemic species; and
- Sites of particular important because of their scientific, educational, cultural or aesthetic quality.

32. The establishment of a list of SPAMIs is laid out in Article 8 and which may include sites which:

- Are of importance for conserving the components of biological diversity in the Mediterranean
- Contain ecosystems specific to the Mediterranean area or the habitats of endangered species.

33. Article 16 of the Protocol provides for criteria to be adopted in the choice of protected sites and which are included in Annex I as "*Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI List*".

34. Annex I of the SPA/BD Convention presents the criteria as a) general principles; b) general features of the areas that could be included in the SPAMI List; c) legal status, and; d) protection, planning and management measures as follows:

A. General Principles: include the objectives of characterising the SPAMIs and the need for a scientific basis in the selection, the need for representativeness of the Mediterranean region and its biodiversity, require the creation of a network of protected areas based on international cooperation, and emphasize the model role of SPAMIs for the region's marine conservation efforts.

B. General Features: the SPAMI must fulfil at least one of the criteria as stated in Article 8, paragraph 2 of the Protocol), i.e. that the area must be of importance for conserving the components of biological diversity, the area must contain ecosystems specific to the Mediterranean area or the habitats of endangered species and that the area is of special interest at the scientific, aesthetic, cultural or educational levels. Further criteria to assess an areas importance in the regional context include:

- Uniqueness. The area contains unique or rare ecosystems, or rare or endemic species;
- Natural representativeness. The area has highly representative ecological processes, or community or habitat types or other natural characteristics. Representativeness is the degree to which an area represents a habitat type, ecological process, biological community, physiographic feature or other natural characteristic;
- Diversity. The area has a high diversity of species, communities, habitats or ecosystems;
- Naturalness. The area has a high degree of naturalness as a result of the lack or low level of human-induced disturbance and degradation;
- Presence of habitats that are critical to endangered, threatened or endemic species (Annex II presents endangered or threatened species);
- Cultural representativeness. The area has a high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature which support the well-being of local populations;
- Value to research in the field of natural sciences or for activities of environmental education or awareness or the presence of outstanding natural features, landscapes or seascapes is a further criterion for inclusion in the SPAMI List.

35. Beside the fundamental criteria listed above, further criteria should be considered for inclusion of the site on the list and include:

- the existence of threats likely to impair the ecological, biological, aesthetic or cultural value of the area;
- the involvement and active participation of the public in general, and particularly of local communities, in the process of planning and management of the area;
- the existence of a body representing the public, professional, non-governmental sectors and the scientific community involved in the area;
- the existence in the area of opportunities for sustainable development;
- the existence of an integrated coastal management plan within the meaning of Article 4 paragraph 3 (e) of the Convention.

- C. **The legal status:** requires for sites to be guaranteed long term legal protection.
- D. **The “Protection, planning and management measures”:** requires conservation and management objectives and protection, planning and management measures to be clearly defined and that conservation and management objectives and the existing threats are addressed based on adequate knowledge or through scientific programmes should existing knowledge be insufficient.

2.2 Overview of Available Environmental Baseline Data for SPAs

36. A list of current SPAMIs and the reasons for their designations is available at the SPA/RAC website (<http://www.rac-spa.org/spami>).
37. It is noted that the current SPAMIs, occur along the coasts so that offshore developments (i.e. >12 nautical miles from the shore) will not directly impact on these areas, although mobile species for which some areas are designated (i.e. marine mammals and turtles) may be affected. As such, there may only be a few, if any, offshore developments which require special restrictive measures and conditions for specially protected areas in the Mediterranean Sea at present. Designations of SPAMIs further offshore in the future, however, would increase the potential for interaction within offshore leases and with it, the requirement for mitigating measures. With this in mind, it is perhaps relevant to identify the characteristics of possible future SPAMI designations, and particularly those that are planned in offshore areas, where the greatest potential for interaction with development applications exist.
38. A total of 15 offshore SPAMIs within ten Ecological or Biologically Significant Areas (EBSA) have been proposed as presented in Figure 2 and Table 1 (UNEP-MAP-SPA/RAC, 2010).

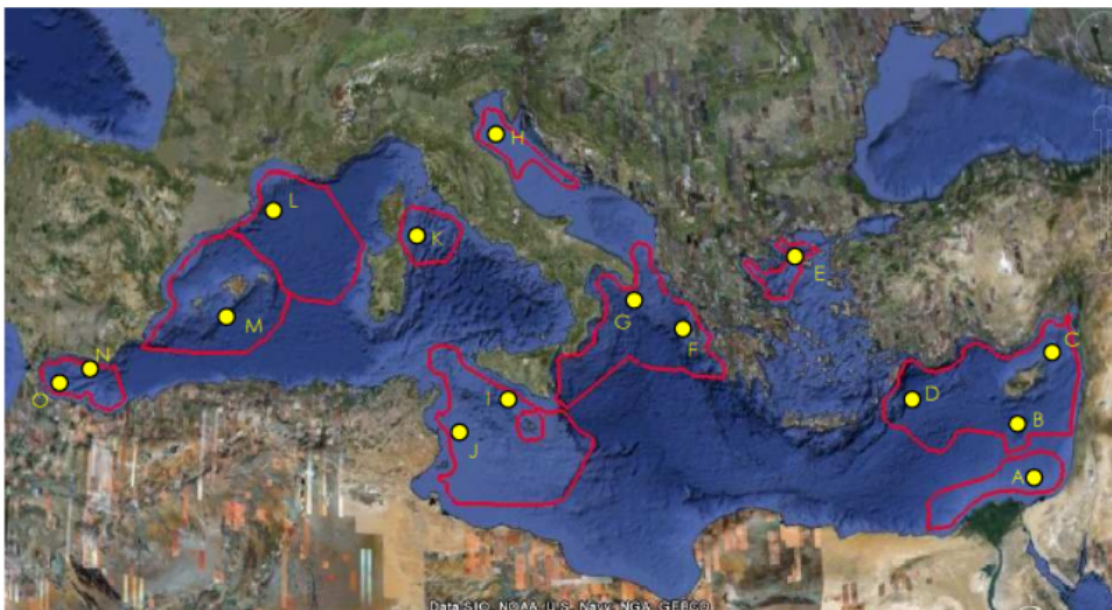


Figure 2: Location of proposed offshore SPAMIs and EBSAs (source: UNEP-MAP-SPA/RAC, 2010)

Table 1: Proposed Offshore SPAMIs and Key Habitat Features (source: UNEP-MAP-SPA/RAC, 2010)

Proposed SPAMI Location (indicative)	Key Features
A. Nile Delta Region:	This southern portion of the Levantine Sea includes recently discovered cold seeps, as well as important sea turtle, and possibly cetacean, habitat.
B. Eratosthenes Seamount:	The seamount has been identified by the GFCM as a critical fisheries habitat and is designated as an FRA and represents high productivity of pelagic and deep-water species, and rich and diverse benthic fauna.
C. North-eastern Waters off Cyprus:	This area encompasses important bluefin tuna spawning grounds as well as key marine mammal habitat.
D. Rhodes Gyre:	This oceanographic feature is the most productive in eastern Mediterranean pelagic waters and is likely to provide critical habitat for both fishery species and marine mammals.
E. Northern Aegean:	This portion of the Aegean Sea is highly productive and includes key habitat for the Mediterranean monk seal and other marine mammals, as well as deep sea coral habitat. The corresponding EBSA encompasses the Greek National Marine Park of Alonissos and the Northern Sporades. Aegean Sea.
F. Northeastern Ionian:	The northeastern Ionian Sea includes cetacean critical habitat and important nursery areas for several shark species.
G. Southern Ionian:	In addition to supporting a broad array of Mediterranean diversity, this northern extent of the Ionian has significant deep sea coral habitat.
H. Northern Adriatic:	This portion of the Adriatic has a high natural productivity that supports an extensive food web, including loggerhead sea turtles and several shark species. Considering the high level of degradation of the North-western Adriatic Sea, establishing a protected area in this site would require significant marine restoration effort.
I. Northern Strait of Sicily:	This portion of the south-central Mediterranean contains critical cetacean habitat, deep-sea corals, seamounts, and highly productive banks.
J. Tunisian Plateau:	The Tunisian Plateau region of the Sicily Strait supports a high productivity and nursery areas for several shark species.
K. Central Tyrrhenian:	This portion of the Tyrrhenian Sea, adjacent to the Pelagos Sanctuary, is highly productive, supporting marine mammal and shark species.
L. Gulf of Lion Shelf and slope:	This highly productive shelf region of the greater Gulf of Lion also contains deep sea canyons of biodiversity significance. The area also shares important cetacean habitats with the contiguous Pelagos Sanctuary, and is likely inhabited by the same cetacean populations that occur in the Sanctuary. It represents the natural continuation westward, involving waters off France and Spain, of cetacean conservation measures foreseen in the Pelagos Sanctuary.
M. Southern Balearic:	This area of the Western Mediterranean contains seamounts and provides critical spawning habitat for bluefin tuna and critical cetacean habitat as well.
N. Alborán Seamounts:	The seamounts in this portion of the Alborán Sea support a wide array of marine biodiversity, and the site contains cetacean critical habitat.
O. Southwestern Alborán:	The southwestern portion of the Alborán Sea is highly productive and is also a transit corridor for migratory species of the eastern Atlantic and Mediterranean Sea.

39. Further research is required to identify boundaries of these proposed areas and to justify their “representativeness” within the context of the SPA\BD Protocol. Data are also required to develop associated management plans so that the SPAMI network continues to encapsulate the biodiversity of the Mediterranean region and addresses perceived threats (UNEP-MAP-SPA/RAC, 2010).

40. The timing for further offshore SPAMIs to come on-line and to be incorporated within the overall network of specially protected areas is therefore unclear at present and will depend upon the availability and quality of supporting evidence. To this end, collaboration and data sharing between regional organisations and offshore industry may be beneficial in data poor areas, where possible. Mitigation measures presented here may need to be reviewed and refined in the future to account for the biological characteristics and nature conservation objectives of offshore SPAMIs depending on of the selected SPAMIs.

Chapter 3: Special Provisions Required for Activities in SPAs

41. Decisions on the permitting of offshore development proposals, and the scope for any associated special provisions, are typically made on a case-by-case basis following statutory Environmental Impact Assessment (EIA) and detailed analysis of the likely significance of the impacts of their construction, operation, maintenance and decommissioning activities on the receiving environment, including any specially protected areas or features for which they are designated. The requirements for an EIA are provided for in Article 5 of the Offshore Protocol and the minimum content expected is explained in Annex IV. The EIA process is further detailed in the Environment Impact Assessment guidelines from Offshore activities prepared in consultation with the OFOG subgroup on environmental impact. Where identified, significant impacts are required to be mitigated through the introduction of some form of agreed intervening measure which either eliminates the impact or reduces its severity to an acceptable level.

42. This chapter reviews the measures and controls that have been introduced, typically as part of EIA or other statutory assessment processes, to mitigate significant effects of offshore development proposals relevant to the consideration of specially protected areas and the features for which they have been designated. Drawing upon the review, document UNEP/MED WG.461/20 provides specific practical guidance for special restrictions or conditions for specially protected areas.

3.1 Special Provisions for Offshore Geophysical Surveys

43. Offshore geophysical surveys are typically undertaken as part of marine site and resource characterisation studies and can have a number of effects on the marine environment which can adversely impact on valued habitat and species features. Effects can relate to the introduction and spread of marine non-native species, disturbances to species due underwater noise emissions, entanglement in towed equipment, vessel presence and collisions. However, unlike development proposals themselves, proposals for pre-application, exploratory geophysical surveys, typically fall outside of statutory EIA processes and are instead assessed and mitigated under separate, country-specific, arrangements. The following briefly discusses the potential effects of marine geophysical surveys and associated existing standards and guidance for mitigating actions.

3.1.1 Non-native Species

44. Vessels used for geophysical surveys may act as vectors for the introduction and spread of non-native marine species resulting in potential impacts on local biodiversity and management objectives for specially protected areas. The potential threat of non-native species to biodiversity in the Mediterranean is reflected in Article 13 of the SPA/BD Protocol which requires Parties to take all necessary measures to regulate the accidental or intentional introduction and spread of non-native species to the wild and to prohibit those that may be harmful to biodiversity. In recognition of the potential harm that non-native organisms can cause, the International Petroleum Industry Environmental Conservation Association (IPIECA) has produced specific guidance on a range of measures to be adopted to reduce the risk of the introduction and spread of non-native species (<http://www.ipieca.org/resources/good-practice/alien-invasive-species-and-the-oil-and-gas-industry/>). This delivers practical information to on-the-ground staff at onshore and offshore projects and

operations, helping them to identify key issues and solutions and to embed active consideration of alien invasive species (AIS) from the earliest stages of the project.

45. Relevant measures include (i) the sourcing of local vessels for the conduct of the geophysical survey as well as for use as chase vessels which are used to protect seismic cables and other towed equipment and (ii) restricting the use of vessels to those which have documented non-native species capabilities, such as ballast water treatment and management systems, in accordance with the IMO's International Convention for the Control and Management of Ship's Ballast Water and Sediments (see section 1.3.7, above).

46. Relevant Strategic Priorities and Actions adopted by the Contracting Parties in the framework of the Mediterranean Strategy on Ships' Ballast Water Management, including its Action Plan and Timetable (see Section 0, above) should also be considered, in particular continuation of research efforts to improve understanding of the relationships between vessel traffic and invasive alien species (Strategic Priority 3), use of risk assessment tools (Strategic Priority 4) incorporating standard biological monitoring of Mediterranean ports (Action 4) and harmonisation of a regional ballast water management amongst Mediterranean coastal states.

47. Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (Biofouling Guidelines) ([resolution MEPC.207\(62\)](#)) have been adopted by the Marine Environment Protection Committee (MEPC) at its sixty-second session in July 2011 and were the result of three years of consultation between IMO Member States. These guidelines are intended to provide a globally consistent approach to the management of biofouling, which is the accumulation of various aquatic organisms on ships' hulls.

3.1.2 Underwater Noise

48. Although unlikely to impact on the physical characteristics of a specially protected area, underwater noise from sound sources used during geophysical surveys may disturb or harm marine species such as marine mammals, reptiles and fish for which the site is designated, as well as commercially and ecologically important fish species. Effects may include avoidance of key spawning, nursery or breeding habitat, disruption of migration behaviours, physiological damage and mortality. There are a considerable number of guidelines for mitigation options to alleviate adverse noise impacts from geophysical surveys on marine life. Many countries and some organisations have developed their own guidelines in relation to increases in offshore oil and gas and renewable energy activities and associated explorative surveys.

49. At the Mediterranean Sea region level, guidance on underwater noise mitigation measures is offered in the Agreement on the Conservation of Cetacean of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS) and covers a wide range of operational noise producing activities, including seismic survey (ACCOBAMS, 2013).

50. Most guidance on mitigating adverse underwater noise however, is available at the national level. Several reviews of national level guidance on mitigating the effects of underwater noise of seismic surveys on marine species are available (e.g. Compton et al., 2008; Weir & Dolman, 2007 and Nelms et al., 2016) all of which revolve around the principle of separating sensitive receptors from significant sound sources in space and/or time. Typically, the mitigation measures relate to spatial and

temporal zoning of activities to avoid known sensitive locations and periods, the imposition of a safety zone around the sound source, a suspension of works should a marine mammal or turtle enter the safety zone, use of soft-start procedures and use of suitably qualified observers to monitor the safety zone. Shooting of air-guns is typically halted, or the power and/or frequency of the shots is reduced, during long line turns depending on the duration of the turn. The size of the safety zone differs considerably between guidance with larger zones (up to 3 km) being criticised in some texts as being impractical to monitor effectively. A safety zone of radius 500 m around the sound source seems to be the consensus opinion on this matter. There are also discrepancies between the guidance on whether the shooting of air-guns (or other noise emitting equipment) should stop on sighting a marine mammal within the safety zone once the shooting is underway. The position of the most recent guidance document (JNCC, 2017) is that the shooting can continue in this instance and would appear to be a practical solution as the marine mammal in question is not demonstrating any aversive behaviour. The use of passive acoustic monitoring systems (PAM) for the detection of marine mammals including during hours of darkness is encouraged in many of the guidance documents and is useful mitigation during periods of poor weather where the effectiveness of visual observation methods may be impaired. In the Gulf of Mexico, for example, PAM is required to confirm that the area is clear of cetaceans before a soft start procedure can commence.

3.1.3 Entanglement

51. Sea turtles may be at risk from geophysical surveys through entanglement in the tail buoys of seismic cables, and with other towed equipment, during survey operations causing harm or mortality. The fitting of turtle guards or the use of “turtle friendly” tail buoys may mitigate this risk, and several designs and gear configurations are reviewed in Ketos Ecology (2006), although the actual efficacy of these measures is unclear at present due to the lack of relevant field testing and reporting.

52. The above, notwithstanding, the use of these types of mitigation may be regarded as good industry practice and are currently in use in various locations around the world. For example, the use of a turtle guard system was proposed as mitigation for potential entanglement of turtles in tail buoys during recent geophysical campaigns offshore of Myanmar (Total E&P Myanmar, 2017).

53. Two species of sea turtles regularly nest in the Mediterranean including the loggerhead turtle (*Caretta caretta*) and the green turtle (*Chelonia mydas*). A further three species, including the Leatherback turtle (*Dermochelys coriacea*), Hawksbill turtle (*Eretmochelys imbricata*) and Kemp’s turtle (*Lepidochelys kempii*) are also recorded in the region, although the latter two species are only recorded relatively rarely. The importance of the conservation of turtles in the Mediterranean is highlighted by contracting parties to the Barcelona Convention listing the five species that occur on the List of Endangered and Threatened Species annexed to the SPA/BD Protocol (see Section 1.3.3). A series of Action Plans for the Conservation of Marine Turtles have also been developed, the most recent of which was prepared by SPA/RAC (UNEP MAP SPA/RAC, 2007). Countries may also designate and legally protect turtle nesting sites through national planning or fisheries legislation (e.g. Lara/Toxeftra reserve, Cyprus) (Ministry of Agriculture, Natural Resources and the Environment, Cyprus, 2012).

54. Current guidance on the handling and treatment of turtles which have become entangled in fishing gear is prepared by the Marine Conservation Society ([MCS Turtle Code](#)) and by SPA/RAC

([SPA/RAC Turtle Handling Guidebook](#)) and should be used as a basis for developing similar guidance for towed seismic survey equipment.

3.1.4 Oily Discharges

55. Vessel compliance with MARPOL guidelines as a minimum will be sufficient to protect specially protected areas from oily discharges during geophysical investigations. The Mediterranean Sea itself is designated as a Special Area under MARPOL and receives higher levels of protection, requiring special mandatory methods with regards to prevention of pollution by oil (Annex I of MARPOL) compared to other sea areas. Mandatory methods under Annex I of MARPOL include the prohibition of any discharges of oily mixtures in special areas unless certain conditions relating to the processing, dilution and origin of the oily mixture and whether the vessel is proceeding *en route* are satisfied.

3.1.5 Temporal Restrictions

56. Consideration of the timings of geophysical surveys is encouraged in most guidance on mitigating underwater noise effects so that sensitive ecological periods such as fish spawning, seal pupping and marine mammal migration may be identified and avoided. Applicants may be required to supplement permit applications to conduct geophysical surveys with literature reviews and consultations to clearly establish the spatial and temporal distributions and key life cycle stages of sensitive receptors to inform final survey planning. Competent authorities may also wish to engage with applicants with respect to this endeavour, including knowledge sharing and coordination of stakeholder opinions.

3.2 Special Provisions for Offshore Operations

57. The impacts of offshore operations may relate to the disposal of cuttings, fluids (drilling muds) and chemicals which may have adverse ecological effects including smothering and toxic responses. Vessel discharges may include tank or engine room bilge waters as well as drainage from the decks of rigs and vessels and which can contain oil. Discharges of grey and black water and organic wastes from vessels and platforms could also harm the marine environment. Anchoring or the placement of infrastructure on the seabed can disturb seabed habitats.

3.2.1 Management of Discharges

Best practice for the management of discharges within national waters and Convention areas has been comprehensively reviewed in REMPEC/WG.35/INF.3 and has been considered in the preparation of the Mediterranean common offshore standards and guidelines on the disposal of oil and oily mixtures and the use and disposal of drilling fluids and cuttings and analytical measurements (REMPEC/WG.45/13/2, Mediterranean Offshore Guidelines and Standards: Common Standards and Guidance on the Disposal of Oil and Oily Mixtures, and the Use and Disposal of Drilling Fluids and Cuttings). Additionally, UNEP/MED WG.461/12, Mediterranean Offshore Guidelines and Standards: (Draft) Guidelines for the Conduct of Environmental Impact Assessment (EIA) provides information on the minimal criteria which must be included within an application for a chemical use and discharge permit.

58. Already accepted standards on the management of discharges are provided in Annex I and Annex II of the Offshore Protocol which lists substances for which disposal is prohibited and which require a special permit, respectively. Furthermore, Annex V (B.2(d)) of the Offshore Protocol states that the discharge of drill cuttings and oil-based drilling fluids is prohibited in specially protected areas.

59. While not related directly to specially protected areas, Cordes et al. (2016) note that restrictions on, and the prohibition of, the discharge of non-aqueous drilling fluids are increasingly practiced in many countries. The authors go on to note the considerable environmental benefits that have been achieved amongst OSPAR Contracting Parties through the prohibition of whole organic phase fluids and cuttings containing organic phase muds of more than 1% by weight and the typical requirement for permits for the use and discharge of chemicals, including drilling muds and cuttings.

60. Contracting Parties to OSPAR have adopted the Harmonised Mandatory Control System (HMCS) to consolidate existing regulations on the discharge of chemicals and to protect the marine environment by identifying and restricting discharges of potentially harmful substances at sea. Under the HMCS, chemicals are not permitted to be used without prior authorisation including characterisation of its toxicological, biodegradable and bioaccumulation properties. All listed chemicals are assigned a general hazard ranking and, depending on this, further assessment and/or justification is required for each individual chemical additive in every permit application for offshore operations. The list is updated regularly and can be downloaded from: <https://www.cefas.co.uk/cefas-data-hub/offshore-chemical-notification-scheme/>

61. The World Bank Group Environmental, Health, and Safety Guidelines for Offshore Oil and Gas Development (2015) offers guidance on the quality of effluents and requires that discharges to near-shore waters should be established on a case-specific basis, taking into account the environmental sensitivities and assimilative capacity of receiving waters. It also stipulates that drill cuttings and fluids should be re-used or shipped to shore unless certain quality criteria are met, in which case disposal to sea via a caisson is permitted. With regard to sensitive areas the following recommendations are made:

- Hydrotest water disposal into shallow coastal waters and sensitive ecosystems should be avoided;
- During well testing, flaring of produced hydrocarbons should be avoided, especially in environmentally sensitive areas.

62. In the US, a General Permit (GMG290000) is required for discharges of pollutants from offshore oil and gas activities under the National Pollutant Discharge Elimination System (NPDES). Permit applications for sensitive areas require a dedicated environmental assessment considering potential effects on sensitive features, such as local essential fish habitats (EFH) and National Marine Sanctuaries. Additional conditions will be set out in the General Permit for such sensitive features, which may include the prohibition of certain discharges in designated National Marine Sanctuaries, for example.

63. Under the European Council Directive 92/43/EEC (Habitats Directive) some European jurisdictions require dedicated assessments to be undertaken “*in respect of any plans or projects that*

either alone or in combination with other plans or project would likely have a significant effect” on an international nature conservation site. This type of assessment is separate from the EIA, although considerable information is typically drawn from it. This type of dedicated assessment is intended to address specific aspects of the development which are likely to have a significant impact on the integrity of the nature conservation site, in light of its nature conservation objectives.

64. As well as operational discharges, accidental leaks and spillages may also occur. Article 16 and Annex VII of the Offshore Protocol lays out the obligations of operators in respect of oil spill contingency planning. There is considerable guidance available in this regard for example, IOGP (2015), Premiam (Pollution Response in Emergencies: Marine Impact Assessment and Monitoring (Law et al., 2011; 2014) and International Tanker Owners Pollution Federation Ltd. (ITOPF) (2016) which includes the preparation of sensitivity maps to show, amongst other features, environmentally sensitive areas to inform appropriate spill responses and site-specific shore protection. Where appropriate, the stockpiling of dedicated contingency equipment for rapidly treating and containing oil spills is recommended.

65. Article 16 of the Offshore Protocol also requires that in cases of emergency the Contracting Parties shall implement *mutatis mutandis* the provisions of the Protocol concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency. Decision IG.23/11 related to the Mediterranean Guide on Cooperation and Mutual Assistance in Responding to Marine Pollution Incidents, adopted by the 20th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols, held in Tirana, Albania, from 17 to 20 December 2017, provides further guidance on this matter.

3.2.2 Monitoring Conditions

66. UNEP/MED WG.461/12, Mediterranean Offshore Guidelines and Standards: (Draft) Guidelines for the Conduct of Environmental Impact Assessment (EIA), introduces the strategy, themes, and products of the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP) and points to the collaborative efforts within the UNEP/MAP Barcelona Convention to implement the Ecosystem Approach Process (EcAp) (EcAp Roadmap) to assess the status of the Mediterranean and achieve Good Environmental Status through the monitoring of relevant qualitative indicators. Continued review and rationalisation of these qualitative indicators will provide the necessary focus and context for monitoring of offshore activities in the Mediterranean and assessment of environmental status trends over time as a result of offshore exploration and exploitation activities.

67. Monitoring conducted during offshore operations can indicate potential effects on the seabed environment, and particularly on sensitive sessile organisms that might be impacted by increased sedimentation from the discharges of drill cuttings (OSPAR, 2004; IOGP, 2012). Generally, the available guidance does not cover monitoring of specially protected areas although provision for sensitive habitats and species are considered in some documents addressing analogous features outside of the Mediterranean region. For example, the Programme for the Red Sea and Gulf of Aden (PERSGA) offers a standard suite of monitoring survey methods for a range of valued habitats including coral reefs, seagrass, seaweed beds, other subtidal communities, intertidal communities,

mangroves as well as faunal groups such as reef fish, turtles, sea birds and marine mammals (PERSGA/GEF, 2004). Adoption and modification of these standards could be attempted to fit local situations and indeed, Buchanan et al. (2003) note that environmental monitoring may require custom surveys to be designed for sensitive areas and that these may involve more detailed and systematic monitoring compared to those required for non-sensitive areas.

68. A good example of bespoke guidance for marine environmental monitoring for planned oil and gas activities has been recently developed for Sudan in recognition the high value of Red Sea ecosystems (Norwegian Institute for Water Research (NIVA) (2015). This guidance calls for the need for monitoring to “*fit the purpose of providing relevant information on specially prioritised valued ecological components (VECs)*” and their responses to oil and gas activities. A collaborative and iterative approach to survey design is recommended between project proponents and the Competent Authority to achieve this aim.

69. In Norway, it is acknowledged that the monitoring survey itself could have adverse environmental consequences. For example, the use of grab samplers for the collection of seabed samples is deemed unsuitable for sensitive benthic habitats including reefs and areas of corals and sponges (Norwegian Environmental Protection Agency, 2015). In these areas, visual inspection by ROV is required. Towed and drop-down camera systems are permitted for use but are noted to be limited to linear, transect type surveillance work.

70. Israeli guidance (Marine Environment Protection Division (MEPD) (Israel)) (2016) requires observations of individuals of marine mammals, sea turtles and birds as well as aggregations of pelagic and benthic fish made during environmental monitoring surveys of offshore operations to be documented. In addition, phenomena that are unique to the habitats such as abundance of unique species, presence of indicator species, breeding grounds or nurseries, if observed, species abundance, ground cover and any other component that describes the habitat are required to be reported. Species should also be classified according to their endemic or migrant status.

3.2.3 Temporal and Spatial Restrictions

71. The spatial extents of offshore operations and the boundaries of protected areas may not necessarily be mutually exclusive. In the UK, for example, offshore oil and gas and seabed extraction activities exist within the boundaries of the North Norfolk Sandbanks and Saturn Reef, Dogger Bank and Shetland and Faeroe Islands Sponge Belt nature conservation areas. However, there are also a number of examples of existing guidance and practice where a spatial and/or temporal separation is desired, and which may be relevant to the development of common standards for special measures for specially protected areas in the Mediterranean.

72. In Australia, recent draft management plans include provision to exclude or restrict mining activities, including exploration and exploitation and the laying of pipelines in designated Marine Parks. For example, under the draft plan, mining operations in the Coral Sea Marine Park are prohibited (Director of National Parks, 2017). Also, the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) has not permitted oil and gas activities within the Sable Gully Marine Protected Area in Canada (<https://www.cnsopb.ns.ca/environment/marine-protected-area>).

73. Conditions relating to offshore activities and sensitive seabed features are promulgated in the U.S. via Notice to Lessees and Operators (NTLs). In the US GoM, these stipulate mitigation zones around particular topographical features that might support sensitive biological communities and within which development activities are prohibited (e.g. NTL No. 2009-G39). Buchanan et al. (2003) note that here, the emphasis is on spatial zoning to avoid sensitive areas and that this is underpinned by a substantial evidence base.

74. E&P/UNEP (1997) guidance requires that the least sensitive location, within the confines of the bottom target/drilling envelope, be selected and that directional drilling techniques to access targets below sensitive features should be considered. Similarly, guidance for oil and gas exploration and development in India advises that sensitive areas, such as fish spawning areas or areas that contain rare or endangered species, should be avoided (Ministry of Environment and Forests, 2009). Mitigation guidance in Norway (Norsk Olje og Gass, 2013) requires that the operator must, as a priority, position the well head location on the sea floor with the lowest impact on the local sensitive seabed fauna, as far as is practicable, and in consideration of the potential impacts of anchors and mooring lines in the event that a moored drilling unit is planned to be used. Other measures provided for within the Norwegian guidance include:

- The use of dynamic positioning rigs to avoid the use of mooring anchors in potential sensitive areas;
- Pre-laying of anchors prior to the arrival of the rig to achieve accuracy in positioning of anchors and chains and to avoid corals and environmentally sensitive habitats;
- Avoidance of grappling for pick-up of anchor chains and to employ ROV or pick up buoys for this purpose;
- Replacing the anchor chains in part by fibre (nylon) wire and made buoyant by attaching buoys to the fibre wire that may to avoid interference with corals;
- Use of larger, heavier anchor or larger dimension anchor chain to reduce the chain length to reduce the footprint and/or adding flexibility in anchor position.

75. Temporal restrictions have been proposed on drilling activities within an area of *Lophelia pertusa* reefs in Norway (Norsk Olje og Gass, 2013). *Lophelia pertusa* is regarded to be the most important reef-forming corals in the North Atlantic and the Norway holds the largest known reef system in the world. This species spawns mainly between January and March and, may be particularly sensitive to raised suspended sediment concentrations, including the discharge of drilling fluids and cuttings. Recommendations to delay drilling activities near *Lophelia* reefs during main spawning periods were proposed to avoid potential adverse impacts on this species during this ecologically sensitive period.

76. In the UK, licence conditions set out periods of concern for seismic surveys and drilling operations for each licence block based on concerns about possible environmental effects of seismic surveys or drilling operations (e.g. because of potential adverse effects on seabirds or fish spawning). The Block specific licence conditions also identify areas where a herring spawning seabed survey may be required before any drilling activity, to confirm whether there are any herring spawning sites within a three-nautical mile radius of the proposed drilling location. On the basis of the herring spawning survey results, the statutory consultees of the Competent Authority may recommend that the drilling

operation should be relocated or re-scheduled, or recommend that the statutory authority should include additional conditions in the environmental approvals.

77. Restrictions on aggregate extraction activities within the eastern English Channel are in place to mitigate for potential adverse effect on spawning herring (Marine Management Organisation, 2015) and licence conditions for some UK aggregate areas require a spatial buffer between dredging and biogenic reef communities.

3.3 Special Provisions for Field Developments

78. The installation and operation of offshore oil and gas activities can physically disturb pelagic and benthic habitats and species due to the placing of platform legs, drilling/wellhead templates, pipeline installations, production discharges as well as increases in underwater noise. Effects of light emissions from offshore structures on birds are also of potential concern.

3.3.1 Management of Discharges, Noise and Light Emissions

79. Standards for effluent discharges are promulgated by OSPAR (2004) and the International Finance Corporation (IFC) (2015). IFC (2015) also calls for sufficient back-up treatment systems to be available to ensure continuation of operations in case of failure of the primary system. MARPOL guidelines control the discharges of wastes, black and grey water, deck drainage, sewage and ballast from vessel and platforms and are referred to in the IFC advice. In their overview of oil and gas development worldwide, Kloff & Wicks (2004) note that production water is increasingly re-injected and that discharges to ecological vulnerable areas and near shore waters are prohibited.

80. ACCOBAMS (2013) provides guidance on suitable underwater noise mitigation measures, including the use of bubble curtains, hydrostatic nets and casings, where appropriate. In Germany, strict conditions on maximum permissible noise levels apply during offshore wind farm construction and such mitigation measures may be required to achieve compliance (Bundesamt für Seeschifffahrt und Hydrographie (BSH), 2013). In the UK and Netherlands, temporal restrictions of noisy construction activities for offshore wind farm developments are imposed to avoid adverse noise impacts on sensitive life cycle stages (English et al., 2017).

81. In response to concerns that platform lighting has adverse impacts on certain migrating bird species, OSPAR issued guidance (OSPAR Agreement 2015-08) on measures to reduce associated effects. The guidance requires that all lighting equipment on offshore platforms be reduced as far as possible, while still allowing for safe operations and suggests various measures to achieve this including the use of automatic lights, shielding of lights, encasing drilling towers and adapting the spectrum of lighting to bird friendly systems. Gas flaring may also affect night time migration behaviour of birds (OSPAR, 2007; Day et al., 2015). The UK Oil and Gas Authority require that this activity be kept to the minimum possible (Oil and Gas Authority 2016). In addition to the lighting mitigation, Wiese et al. (2001) also recommend that flare shutdowns for maintenance be scheduled to coincide with critical periods of bird migration.

82. The use of silt curtains or turbidity barriers are recommended good practice to mitigate for the potential effects of sediment plume discharges in relation to dredging and port construction around

coral reefs (PIANC, 2010; HR Wallingford, 2012). Silt curtains were also included as mitigation to limit sediment transport from mooring and pipeline installation works relating to the Aguirre LNG import terminal development in Puerto Rico (Federal Energy Regulatory Commission, 2015).

3.3.2 Monitoring Conditions

83. UNEP/MED WG.461/12, Mediterranean Offshore Guidelines and Standards: (Draft) Guidelines for the Conduct of Environmental Impact Assessment (EIA), explains the role of IMAP and the EcAp process in framing current environmental monitoring within the Mediterranean.

84. As part of the field development phase, longer-term programmes of monitoring are established to provide information on the recovery of the seabed and communities and the levels of contamination in waters, sediments and biota during development and production phases (IOGP, 2012). Relevant existing guidance is provided in

85. OSPAR (2004) (Joint Assessment and Monitoring Programmes (JAMP) Guidelines) which highlights the lists of chemicals that should receive particular attention during monitoring studies of offshore developments. The conduct of both regional and site-specific monitoring is provided for within the guidance. The guidelines also advise that different offshore development phases and activities, and local environmental conditions will demand different monitoring frequencies and survey strategies to be established. The use of biologically relevant species is recommended for bioaccumulation and ecotoxicological tests.

86. E&P Forum/UNEP (1997) advises that the detail and frequency of the measurements made during environmental monitoring should reflect the perceived risk. For example, as part of its statutory response to the proposed environmental monitoring plan for the Deep Panuke development, Fisheries and Oceans Canada's (DFO) Science, Maritimes Region, advised that greater consideration of the presence of species at risk should be provided, given the proposed location of the development close to the Gully MPA (DFO, 2011). Also, regular seabird and marine mammal monitoring surveys were required throughout the drilling and exploration phases of the Sable Offshore Energy Project given the importance of the area to these receptors (Canada-Nova Scotia Offshore Petroleum Board, 2011).

87. Detailed monitoring of coral reef, fish abundance and water quality parameters were established as part of the Yemen LNG project (IOGP, 2016). This involved daily site monitoring and in-depth bi-monthly surveys by international experts together with annual verification by an independent expert on biodiversity to confirm any adaptive management needed. Re-design of some aspects of the LNG project was required including the relocation of intake/outfall pipes and the jetty to areas to minimise possible damage to corals. Avoidance opportunities were informed by the detailed baseline monitoring data, with coral biodiversity values accurately mapped before construction. Where impacts to corals could not be mitigated, they were relocated and monitored to evaluate the success of the coral transplantation. Importantly, site specific monitoring incorporated other regional coral monitoring programmes allowing observations to be placed within a wider regional context.

3.3.3 Spatial and Temporal Restrictions

88. Spatial and temporal restrictions for field development and production are similar to those that have been covered in section 3.2.3 above. In addition, Norwegian guidance stipulates that any planned pipeline route should be surveyed at least 100 meters to each side and that if a high density of coral structures is expected the survey should be extended to total of 500 meters. Also, to avoid harm to coral communities, consideration should be made to adjust the pipeline route such that a minimum distance of 50 meters between the corals and the final pipeline location is maintained. Use of a DP vessel for the deployment of the pipeline should be considered where high densities of corals are detected.

3.4 Special Provisions for Decommissioning Operations

89. Decisions on the fate of offshore installations will need to be implemented at the end of their operational life or on expiry of the licence. Most often, this comprises complete removal of all items from the seabed. Effects of removal of offshore structures in the marine environment include increased underwater noise, seabed disturbance and potential release of chemicals, e.g. as a result of the disturbance of deposited drill cuttings.

90. Typically, a decommissioning plan and EIA will be prepared providing the environmental and socio-economic context, the nature of the items to be decommissioned, the methods for removal and well abandonment and the treatment and assessment of drill cuttings together with an assessment of any alternative to decommissioning, if required, in line with environmental, safety or other considerations.

3.4.1 Removal of Installations

91. Article 20 of the Offshore Protocol requires all installations to be removed from the seabed ensuring that spills and leakages are prevented. The dumping or leaving in place of offshore structures is similarly prohibited within the OSPAR area (OSPAR Decision 98/3) and there is determination to ensure that any derogation of this requirement remains exceptional. The Geneva Convention and the United Nations Convention on the Law of the Sea (UNCLOS) also require any installations or structures which are abandoned or disused to be removed although the latter Convention acknowledges that partial removal may be permissible. IMO Guidelines for the removal of offshore installations and structures on the continental shelf and in the exclusive economic zone (Resolution A.672(16)) require relevant coastal states to decide on a case by case basis whether offshore installations are to be permitted to remain on the seabed.

92. With regards to pipelines, the Offshore Protocol requires that disused or abandoned pipelines are removed from the seabed or that they are cleaned and left *in situ* or cleaned and buried such that they do not cause any pollution, pose an environmental or safety hazard or hinder fishing. There are no international guidelines on the decommissioning of disused pipelines (DECC, 2011).

93. The UK decommissioning guidance on pipelines specifies that all feasible decommissioning options should be considered. Because of the widely different circumstances of each case each pipeline decommissioning programme will be considered on its merits and in the light of a

comparative assessment of the alternative options. In order to arrive at the best decommissioning option, the comparative assessment should examine and compare each option on the basis of: complexity and associated technical risk; risks to personnel; environmental impact; effect on safety of navigation and other uses of the sea; and economics (DECC, 2011).

94. Decisions to leave abandoned infrastructure (other than pipelines) on the seabed in Europe is rare but some examples do exist. For instance, agreements to leave certain parts of the Frigg offshore platforms in place in the northern North Sea were reached, supported by strong environmental arguments, particularly with regard to the comparatively higher CO₂ emissions of the alternative options (OSPAR, 2009).

95. Measures for the management of potential decommissioning impacts in protected areas in the UK have included the mapping of sensitive reef areas to inform anchor placements, the use of mid-line buoys on anchor chains to minimise seabed disturbances and the removal of top-sides and jackets within a single lift and the use of anchored vessels over dynamic positioning vessels to reduce underwater noise (Conoco Philips, 2016; Shell UK Limited, 2017). In these cases, the cutting of the jacket legs/piles 3m below the seabed surface was required. In general, the UK requirement is for piles and legs to be severed below the natural seabed level at such depth to ensure that any remains are unlikely to become uncovered (DECC, 2011).

96. In the UK, it is not necessary to justify the removal of structures that have been colonised by rare or protected species although surveys are still required to understand what species are present and what mitigation measures would be appropriate (DECC, 2011). The presence of significant growths of protected cold-water corals, such as *Lophelia pertusa*, or other species protected under the Convention on International Trade in Endangered Species (CITES) on items which will be returned to the shore may require discussion with the competent authorities with regards to CITES requirements (DECC, 2011; BMT Cordah, 2011).

97. In the US GoM, it is acknowledged, that oil and gas platforms can provide suitable hard substrata for the attachment of sessile species, including corals and can attract aggregations of fish which may benefit from the provision of additional food resources and refuge (Sammarco, 2013). The potential benefit to marine life on and around offshore structures has inspired a “rigs-to-reefs” policy which allows some platforms to become an artificial reef for nature conservation and to support or promote marine habitat (Bureau of Safety and Environmental Enforcement (BSEE), 2013). Under this policy BSEE may grant operators a departure from the normal requirement to remove a platform or other facility and allow partial structures to remain in place so that it can be converted into an artificial reef. The structure then becomes part of the State artificial reef programme.

98. Items not converted to reefs are dealt with under the Notices to Lessees and Operators (NLTs) which are issued by the Bureau of Ocean Management (BOEM). These stipulate requirements for decommissioning of wells, platforms and pipelines and provide references to the relevant US regulations. Whilst not specially referring to specially protected areas, the NLTs do make special mention of wells that are located close to the shore, in environmentally sensitive areas or near other infrastructure. They stipulate that these should be prioritised for plugging or temporary abandonment or isolation within a certain time limit. Operators are also required to apply for a permit to permanently plug any well that poses a hazard to the environment within 30 days of the identifying the

hazard. With regard to platforms and other facilities that are no longer useful for operations (including toppled platforms) these should be removed as soon as possible. If operators propose to use explosives to perform well/casing severance, then this will need to be justified and the potential noise impacts evaluated. Use of explosives during decommissioning is permitted in the UK, but only with strong justification, and should be mitigated using JNCC guidelines for minimising acoustic disturbance to marine mammals whilst using explosives (JNCC, 2010).

99. In Denmark, it is recognised that any installation could have various disposal alternatives and that the final best option may need to be informed by the outcomes of the EIA and technical feasibility studies and in consideration of the natural resources and environmental conditions (Offshore Energy Denmark, 2013). When abandoning a well in Denmark, the site of the well must be returned to its original state prior to the commencement of drilling. A site condition verification study is also required.

100. The presence of significant quantities of drill cuttings on the seafloor at the base of offshore installations may present certain decommissioning challenges concerning sediment disturbance and releases of contaminants. In Norway, it is a requirement to remove drill cuttings and sediments that have buried parts of the structures first, for which a permit is required, and to monitor for the potential effects of the release of associated contaminants.

101. In general, given the potential for the release and dispersal of sediments and contamination, it is often concluded that leaving cutting piles *in situ* following decommissioning is the best environmental option.

102. Excessive biofouling is typically removed on site during the decommissioning process with any remaining biofouling removed and disposed onshore. Norway guidelines require marine fouling to be removed from installations while they are still offshore, and as far as this is technically feasible (Climate and Pollution Agency, 2011). However, it is noted that disposal of fouling material in enclosed shallow waters may result in excessive organic loading leading to oxygen depletion on the seabed. Where this is perceived to be a risk, following assessment, it would appear prudent to dispose of all biofouling material onshore.

3.4.2 Management of Discharges

103. The types of discharges that take place during decommissioning operations are similar in nature as those from drilling and production operations. As such, there is no specific guidance concerning discharges to the marine environment during decommissioning operations. Use and discharge of chemical additives will follow the same permitting and consenting processes as described above for drilling and production operations. Compliance of vessels that are used in the decommissioning activities with MARPOL guidelines will be sufficient to safeguard specially protected areas from the effects of waste, oily substances and ballast water discharges. All process fluids, diesel, produced solids and other chemicals and lubricating oils are typically drained or flushed from the decommissioned items and transported to shore for disposal.

3.4.3 Monitoring Conditions

104. Pre-decommissioning surveys are undertaken to form a baseline for subsequent post decommissioning surveys. These should include a record of the presence of protected species on the installation and within predicted impact areas to inform any mitigation measures needed (DECC, 2011).

105. Once the installation has been removed, post-decommissioning surveys are required to provide information on the condition of the environment and the extent of seabed recovery (IOGP, 2012). This includes a determination of the levels of hydrocarbons, heavy metals and other contaminants in sediment and biota. DECC (2011) advises that the precise requirements of the surveys, and the number of any repeat surveys, will differ according to individual conditions. In Norway, two post decommissioning environmental surveys are conducted at three-year intervals (Oil and Gas, 2012).

106. As well as environmental investigations, DECC (2011) guidelines also require appropriate surveys to be conducted on completion of the decommissioning for the presence and removal of any debris. The area to be covered by these surveys depends on the circumstances of each case but will be a minimum of 500 m radius from the site of the installation.

107. Under the UK Petroleum Act (1998) the liability for any structures that remain on the seabed lies with the facility owner in perpetuity (Oil and Gas UK, 2013). Thus, there remains a liability on its owner to monitor its condition for the purposes of safety. For pipelines left on the seabed, post decommissioning surveys are conducted to assess integrity and are required to cover an area of 100m either side of the pipeline and throughout the entire length, of any decommissioning pipeline. An environmental survey is also conducted including the collection of samples for contaminants analysis and any subsequent monitoring is agreed through a risk-based approach (Oil and Gas UK, 2013).

108. Norwegian legislation is less clear in this regard and requires that liability is agreed between the facility owner and the State such that the State could assume liability based on an agreed financial compensation. Post decommissioning surveys are usually undertaken with the use of an ROV and two environmental sampling campaigns are required (Oil and Gas UK, 2013).

3.4.4 Temporal and Spatial Restrictions

109. Danish guidelines discuss sensitive fish spawning periods but, in general guidance on requirements for temporal restrictions is lacking. Decommissioning plans will require to be supported, and informed, by an EIA which should consider the temporal and spatial distributions of sensitive features. Temporal restrictions on activities that are considered to be noisy may need to consider ecologically sensitive periods and the presence of marine mammals within the vicinity.

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Useful Web Links

Decision IG.22/3. Mediterranean Offshore Action Plan in the framework of the Protocol for the Protection of the Mediterranean Sea against Pollution resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil	https://wedocs.unep.org/rest/bitstreams/8381/retrieve
Regional Activity Centre for Specially Protected Areas	http://www.rac-spa.org
Mediterranean Platform on Biodiversity	http://data.medchm.net/en/
Marine Protected Areas in the Mediterranean (MAPAMED)	http://medpan.org
Food and Agriculture Organization of the United Nations General Fisheries Commission for the Mediterranean	http://www.fao.org/gfcm
International Association of Oil and Gas Producers (IOGP) Alien Species Guideline	http://www.ipieca.org/resources/good-practice/alien-invasive-species-and-the-oil-and-gas-industry/?_sm_au=iQVjktmVWfNDj4W3
Marine Environment Protection Committee 2011 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species. Resolution mepc.207(62)	http://www.imo.org/en/OurWork/Environment/Biofouling/Documents/RESOLUTION%20MEPC.207%5b62%5d.pdf?_sm_au=iQVjktmVWfNDj4W3
Marine Conservation Society Turtle Code	https://www.mcsuk.org/downloads/wildlife/turtlecode.pdf

SPA/RAC Turtle Handling Guidebook	http://www.rac-spa.org/sites/default/files/doc_turtles/sea_turtle_handling_guidebook_eng.pdf
Cefas Offshore Chemical Notification Scheme	https://www.cefas.co.uk/cefas-data-hub/offshore-chemical-notification-scheme/
World Bank Group Environmental, Health and Safety Guidelines for Offshore Oil and Gas Development	https://www.ifc.org/wps/wcm/connect/f3a7f38048cb251ea609b76bcf395ce1/FINAL_Jun+2015_Offshore+Oil+and+Gas_EHS+Guideline.pdf?MOD=AJPERES
JNCC guidelines for minimising the risk of injury to marine mammals from using explosives	http://jncc.defra.gov.uk/pdf/JNCC_Guidelines_Explosives%20Guidelines_August%202010.pdf?_sm_au_=iQVjktmVWfNDj4W3