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Marine Protected Area feature condition and recoverability analysis to support the quantitative aspects of the Environment Act MPA Target reporting

JNCC & Natural England

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Executive summary

A target for the proportion of Marine Protected Area (MPA) 'features' (designated habitats and species) to be in favourable condition by 2042 has now been set in accordance with use of powers granted to the Secretary of State under Section 1 of the Environment Act (2021) (UK Parliament 2021). The regulation, known as the Environmental Targets (Marine Protected Areas) Regulations 2023 (UK Parliament 2023), sets out that before the end of 31 December 2042 the number of protected features within all relevant Marine Protected Areas (MPAs) that are in "favourable condition" is to be no less than 70% of the total number of protected features within relevant MPAs, and with the remainder to be in "recovering condition".

The enforcement of the Environmental Targets (Marine Protected Areas) Regulations 2023, herein referred to as 'the regulation', poses two critical challenges that need to be addressed to meet the reporting requirements against the regulation:

1. How do we define 'favourable' and 'recovering' condition for the purposes of ensuring consistent reporting against the MPA Target?

2. How do we determine recovery potential of MPA features in response to appropriate management intervention?

The latter question is the focus of this report, whereas the former is addressed through a complimentary technical information note on MPA feature condition category definitions (Natural England & JNCC 2026).

This report outlines the methodology and process followed by Natural England (NE) and the Joint Nature Conservation Committee (JNCC) to establish the recoverability of MPA features in response to appropriate management being in place by drawing upon the best available information to project likely condition of MPA protected features. The approach followed four broad stages:

1. An agreed list of MPA features within the scope of the regulation was determined, primarily based upon the UK MPA Network Features List (JNCC 2019). This includes the features of marine Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Marine Conservation Zones (MCZs).

2. The number of instances a protected feature from the agreed list under 1, above, occurred within an MPA was compiled.

3. To determine what proportion of MPA protected features are expected to be in favourable condition by 2042, Natural England and JNCC calculated the recovery potential of each protected feature identified under 1, above, by drawing upon peer-reviewed habitat biotope and species-level sensitivity assessments.

4. The recovery potential of each MPA protected feature was subsequently calculated based on JNCC and Natural England's understanding of current condition and the theoretical recovery potential. The theoretical recovery potential is an expected timeframe for recovery, taken from sensitivity assessment resilience scores. If a feature is in favourable condition, then it is expected to remain in that condition. If a feature is in unfavourable condition, or does not have an assessment of condition, then the potential time it will take to recover is based on the theoretical recovery potential. A key point to consider is that theoretical recovery potential is determined on the basis that all management measures considered necessary to achieve favourable condition are in place and are effective.

This resulting analysis concluded that 71% of features are likely to be in favourable condition by 2042. This was on the premise that all management considered necessary to achieve the conservation objectives of the protected features are in place by the end of 2024.

Contents

1   Introduction

A target for the proportion of Marine Protected Area (MPA) 'features' (designated habitats and species) to be in favourable condition by 2042 has now been set in accordance with use of powers granted to the Secretary of State under Section 1 of the Environment Act (2021) (UK Parliament 2021). The regulation, known as the Environmental Targets (Marine Protected Areas) Regulations 2023 (UK Parliament 2023), sets out that before the end of 31 December 2042 the number of protected features within all relevant Marine Protected Areas (MPAs) that are in "favourable condition" is to be not less than 70% of the total number of protected features within relevant MPAs, and with the remainder to be in "recovering condition".

The enforcement of the Environmental Targets (Marine Protected Areas) Regulations 2023 (UK Parliament 2023), herein referred to as 'the regulation', poses two critical challenges that need to be addressed to meet the reporting requirements against the regulation:

1. How do we define 'favourable' and 'recovering' condition for the purposes of ensuring consistent reporting against the MPA Target?

2. How do we determine recoverability of MPA features in response to appropriate management intervention?

The latter question is the focus of this report, whereas the former is addressed through a complimentary technical information note on MPA feature condition category definitions (Natural England & JNCC 2026).

Favourable condition for a marine feature is achieved when its conservation objectives are met. MPA feature condition is directly affected by its sensitivity (ability to resist change and ability to recover) to pressures (mechanisms through which a human activity effects a feature) to which it is exposed.

Where a feature is sensitive to pressures, management of associated activities is required to reduce or remove the pressure. This is intended to support recovery of the feature to favourable condition. Some MPA features will take longer than others to recover following the removal of pressures, to the extent that they may not be recoverable by 2042. However, if all pressures to which the features are considered sensitive to are reduced or removed, then all features should be in at least an unfavourable, but recovering condition by 2042.

This report outlines the methodology and process followed by Natural England (NE) and the Joint Nature Conservation Committee (JNCC) to establish the recoverability of MPA features in response to appropriate management being in place.

Section 2 of this report explains the development of a collated list of all MPA feature types within English waters and Section 3 describes the collation of the best available information on MPA feature condition and theoretical recovery potential. Together, this information allowed JNCC and Natural England to establish the proportion of MPA protected features that may be expected to be in favourable condition by 2042, subject to all impacting pressures being reduced/removed by the end of 2024. The results from this analysis are subsequently presented in terms of feature recovery potential by 2042 (Section 4).

2   MPA Features List Development

For the recoverability analysis to be undertaken to establish the quantitative aspect of the MPA target, an agreed list of MPA features within scope of the regulation needed to be determined. The starting point for this was the presumption that all MPA features formally listed in site designation orders should be included unless there was a valid reason for their exclusion. This included all marine features designated under the Conservation of Habitats and Species Regulations 2017 (as amended); the Conservation of Offshore Marine Habitats and Species Regulations 2017 (Special Areas of Conservation and Special Protection Areas); or the Marine and Coastal Access Act 2009 (Marine Conservation Zones), within English waters.

JNCC maintains the UK MPA Network Features List (JNCC 2019) to provide a standardised set of protected features (species and habitats) across all MPAs in UK waters. This list was used as a reference point to create an MPA Target feature list for application in English waters, which includes 151 species and habitats. A feature occurrence list was then created which detailed all the features designated in English waters, subject to some entire site and feature exclusions (documented in Sections 2.1 and 2.2, respectively). To provide quality control for the MPA Target feature list, 10% of sites were checked against the site-feature databases maintained by JNCC and Natural England to confirm that all features designated within that site had been included. The resulting list is included within the Environmental Targets (Marine Protected Areas) Regulations 2023 (UK Parliament 2023) as a schedule of the Statutory Instrument.

2.1   Rationale Underpinning Site Exclusions

Sites of Special Scientific Interest (SSSIs) are part of the MPA network as defined under the Marine and Coastal Access Act (2009). These were excluded from this work to avoid duplication with the Environment Improvement Plan SSSI target (HM Government 2023). There are 63 SSSIs with marine components, occupying a total area below mean high water (MHW, the boundary often used for the upper limit of MPAs) of 1,060 km^2. Of this area, 40% do not overlap geographically with an existing Special Area of Conservation (SAC) or Marine Conservation Zone (MCZ) so the habitats protected within that area are not currently covered by the MPA target.

The majority of Ramsar sites overlap with other designation sites (SACs or Special Protection Areas (SPAs)) and the conservation advice packages for SACs and SPAs are considered sufficient to support the management of Ramsar site interests. As a result, there is no sensitivity assessment or condition assessment information for these features, so they cannot be included in the target as it is currently developed. Instead, reporting for Ramsar sites will continue via the Ramsar National Report system.

2.2   Rationale Underpinning the Exclusion or Inclusion of Protected Features

Some inshore sites cross the MHW mark, and as a result, within an MPA, some features may be present that are primarily terrestrial or rely only on the terrestrial part of the site. Monitoring and reporting on these features have always been undertaken separately from MPA features, as they do not contribute to the MPA network. As a result, those features above MHW are not included within the MPA Target.

Due to the dynamic nature of the coast some habitat features can occur in both the marine and terrestrial zones. Where they are predominantly below MHW they have been included in

all sites they occur in. This includes all designated examples of sea caves and saltmarsh and their associated habitats.

Coastal lagoons have been included on a site-by-site basis; those sites that have at least one lagoon below MHW have been included, whereas those with all lagoons above MHW are not included.

Coastal habitats that are found predominately on the terrestrial side are not included; this includes sand dunes and associated habitats, annual vegetation of drift lines, coastal shingle habitats and sea cliffs.

Highly mobile species features are those that regularly move between locations and spend only part of their time and/or lifecycle within the designated site. For these features, site-based management is unlikely to be sufficient on its own to achieve favourable condition. However, management to achieve favourable condition where these features are designated will contribute to the health and resilience of their populations and is an important aim of the MPA network. As such, these features have been included in the target.

For bird species the distinction is a little more complex; many predominantly terrestrial birds rely upon intertidal and marine areas at some stage in the lifecycle, particularly during the winter period. True seabirds, that spend most of their lives at sea, return to land when they need to breed or moult. The background section of the UK MPA Network Features List (JNCC 2019) clearly defines where these features contribute to the MPA network. In summary, bird species listed are those considered to be 'marine' species in a UK MPA context. For a bird to be considered 'marine', the species must be a feature of an MPA protecting an area of the marine environment that is depended upon by that species (i.e. an intertidal or subtidal area below MHW). However, there are some conflicts between this list and those included in Natural England's marine site feature list. It was not possible to investigate each site individually to confirm which met the UK MPA network feature list (JNCC 2019) criteria at the time this work was being undertaken. Therefore, decisions were made at the species, rather than site, level.

For breeding seabirds and waders, it was decided that where they are designated in sites with a marine component these should be included, as it is likely the birds will use the marine area for feeding and thus meet the criteria. For other bird species included in Natural England's marine site feature list, these were checked against the UK MPA Network Features List (JNCC 2019); those that were in both lists have been included. Of those that were only included in Natural England's list, some were clearly marked terrestrial or coastal and are not included. The few marked 'marine' were checked by a Natural England senior ornithologist to confirm if they relied on marine areas or not and included accordingly. In summary, the following species are not included because of this process:

- Aquatic warbler (*Acrocephalus paludicola*)

- Barnacle goose (*Branta leucopsis*)

- Bewick's swan (*Cygnus columbianus bewickii*)

- Bittern (*Botaurus stellaris*)

- Gadwall (*Mareca strepera*)

- Hen harrier (*Circus cyaneus*)

- Montagu's harrier (*Circus pygargus*)

- Nightjar (*Caprimulgus europaeus*)

- Pochard (*Aythya farina*)

- Ruff (breeding only) (*Calidris pugnax*)

- Shoveler (*Spatula clypeata*)

- Whooper swan (*Cygnus cygnus*)

Several SPAs have designated assemblages or groups of birds that are important within the site but do not individually meet designation criteria. There are three assemblages designated within marine SPAs:

- Seabird assemblage

- Waterbird assemblage

- Breeding bird assemblage

The seabird and waterbird assemblages have been included as features in the feature occurrence list as these are likely to be reliant on the marine area, whereas the breeding bird assemblages are not included due to their focus on breeding which occurs terrestrially. The individual species that comprise these assemblages are not included as Natural England do not consider them to have been designated.

3   Determining Current Condition and Recovery Potential

The quantitative element of the MPA target was determined by exploring the relationship between our understanding of current MPA feature condition and how features may be expected to recover in the absence of pressures to which the protected features of MPAs are considered sensitive.

3.1   Current Condition

Current condition is a measure of whether the designated feature of an MPA is meeting its conservation objectives. Ideally, this is determined by a condition assessment (JNCC 2016; Natural England 2020) that evaluates monitoring and other scientific evidence, known as 'direct evidence', that is available for the feature. Each feature has defined attributes (such as extent, distribution, structure, function and supporting processes, e.g. water quality), which are used to determine the health of that feature. Direct evidence is collected to check if these attributes are favourable or unfavourable. If all attributes of a feature are in favourable condition, then the feature overall is in favourable condition.

Where direct evidence is not available, feature condition can be assessed indirectly, through a vulnerability assessment. These assessments use the occurrence and exposure of features to pressures from human activities to which they are known to be sensitive (i.e. if an activity is occurring on, or within proximity to a feature's location, then that feature may be impacted if it is sensitive to the pressures associated with that activity). This method was developed during the MCZ designation process, using a now established and independently reviewed protocol (JNCC & Natural England 2012).

There were a small number of features not covered by the condition assessments or vulnerability assessments. Following the precautionary approach these are assumed to be in unfavourable condition. Case studies have been prepared in Appendix 1 to illustrate how condition assessments have been undertaken when a range of data types are available.

3.2   Theoretical Recovery Potential

The theoretical recovery potential has been taken from feature sensitivity assessment resilience scores (Note that MarESA and the Natural England contracted sensitivity work use the term 'resilience' instead of 'recovery'. However, both resilience and recovery mean the same in the context of this work). The standard method used in UK marine sensitivity assessments was developed by the Marine Life Information Network (MarLIN). The updated version of this is the Marine Evidence-based Sensitivity Assessments (MarESA) (Tyler-Walters *et al.* 2023). These are updated regularly with new evidence, as part of a collaboration currently coordinated by the MarLIN Steering Group, of which Natural England and JNCC are part. Given the extensive development and regular updates to these assessments, they are considered the best available recovery information and as such have been used in this work for all features that have an assessment available.

To support its conservation advice project, Natural England have contracted out development of sensitivity information for some of the features not covered under MarLIN, following a similar methodology. This work was carried out by NatureBureau in 2015/16 to develop sensitivity assessments for several coastal habitats including dune and saltmarsh features. For highly mobile species, the assessments were undertaken by APEM (Perez-Dominguez *et al.* 2016). These assessments look at the direct effects on the features themselves and the effects on the habitats they rely on (supporting habitats). The features with assessments undertaken by APEM and NatureBureau are listed in Appendix 2.

Sensitivity assessments are not available for the designated geological and geomorphological features because they will not recover if damaged. They have been assessed as not recoverable.

Each of the sensitivity assessments categorise biotopes, habitats or species, based on their resistance (ability to withstand) and resilience (ability to recover after) to pressures caused by human activities. The resilience category gives a timeframe in which recovery is expected after the pressure is removed. It is this timeframe that we have used to determine theoretical recovery potential. The categories used and their definitions are given in Table 1. Recovery rates may differ depending on the pressure to which the feature is exposed. However, the most precautionary resilience score has been used to inform the recovery potential.

Table 1. Sensitivity assessment resilience categories used in determining the recovery potential of MPA features. ([1] With the removal of pressures through management measures by 2024. [2] Please note in the sensitivity assessments used in this analysis none of the MPA target features were in this category).

Resilience score	Recovery timeframe	Applicable feature types	Definition	Recovery in the target timeframe?[1]
High	**Recovery within 2 years**	Habitats & low mobility species (MarESA & NatureBureau)	Features with a 'High' resilience score, which will recover within 2 years once pressures have been removed	Features in this category are likely to recover by 2042
High	**Recovery within 3 years[2]**	Highly mobile species (APEM)	Features with a 'High' resilience score, which will recover within 3 years once pressures have been removed	Features in this category are likely to recover by 2042
Medium	**Recovery within 2–10 years**	Habitats & limited mobility species (MarESA & NatureBureau)	Features with a 'Medium' resilience score, which will take between 2–10 years to recover once pressures have been removed	Features in this category are likely to recover by 2042
Medium	**Recovery within 3–6 years**	Highly mobile species (APEM)	Features with a 'Medium' resilience which will take 3–6 years to recover once pressures have been removed	Features in this category are likely to recover by 2042
Low	**Recovery within 6–12 years**	Highly mobile species (APEM)	Features with a 'Low' resilience which will take 6–12 years to recover once pressures have been removed	Features in this category are likely to recover by 2042

Resilience score	Recovery timeframe	Applicable feature types	Definition	Recovery in the target timeframe?[1]
Low	**Recovery within 10–25 years**	Habitats & limited mobility species (MarESA & NatureBureau)	Features with a 'Low' resilience score, which will take between 10–25 years to recover once pressures have been removed	Some features in this category are likely to recover by 2042
Very Low	**Over 12 years for recovery**	Highly mobile species (APEM)	Features with a 'Very low' resilience which will take over 12 years to recover once pressures have been removed	Features in this category are unlikely to recover by 2042
Very Low	**Over 25 years for recovery**	Habitats & limited mobility species (MarESA & NatureBureau)	Features with a 'Very low' resilience which will take over 25 years to recover once pressures have been removed	Features in this category are highly unlikely to recover by 2042

3.2.1 Pressures Excluded from Analysis

There are a small number of pressures that lead to permanent change and thus have very low or no recovery in the sensitivity assessments. As these cannot be recovered from, they were determined to be out of scope for this work.

The pressure 'Introduction or spread of invasive non-indigenous species (INIS)' is also assigned a 'Very low' score across all biotopes/species. This recognises that recovery may be prolonged as INIS can only be removed through either active management or natural processes (Tyler-Walters *et al.* 2023). A site with significant densities of a non-native species is unlikely to recover without active management, which is only possible/likely to be successful in limited situations. Therefore, this pressure can effectively be classed as a permanent pressure, and it has also been excluded from the theoretical recovery potential assessment.

The following pressures were therefore excluded from the analysis:

- Climate change pressures.
- Physical loss (to land or freshwater habitat).
- Physical change (to another sediment type).
- Physical change (to another seabed type).
- Introduction or spread of invasive non-indigenous species (INIS).

3.2.2 Biotope to Habitat Feature Aggregation

In relation to habitats, MarESA provides information on resilience from pressures at a biotope-level (Levels 5 and 6 of the European Nature Information System (EUNIS) habitat classification). As such, the assessments cannot be used in their raw format to provide habitat feature-level information. Several tools have been produced which aggregate the MarESA assessments for the biotopes at Levels 5 or 6 to those that align with designated

features (typically at Level 3). These tools are detailed in Table 2. The resilience scores in MarESA are mainly based upon species ecology information. This means that habitat features will typically have a range of scores for recovery from the MarESA information (e.g. Medium-Low), as the different biotopes that make up that feature have different sensitivities. In this situation the most precautionary score has been used.

3.2.3   Biogeographic Variation

To ensure that any differences in recovery between areas are captured, biogeographical information has been utilised alongside the MarESA assessments. The biogeographical information has been incorporated from two previous projects which assigned the EUNIS classification to the UK's regional seas, for both the inshore and offshore waters (Hiscock 2016; Tillin *et al.* 2020). These projects determined whether each EUNIS biotope is likely to occur in each regional sea, based on a set of rules.

For the offshore features, biogeographic information was based on evidence from Marine Recorder, EUSeaMap, literature and expert judgement. As set out in Table 2, existing tools were available for the offshore features, and these already incorporated biogeographical information from Tillin *et al.* (2020).

For the inshore feature biogeographic information, EMODnet Seabed Habitat Mapping portal and expert judgement was used to assign regions to the biotopes. Figure 1 provides further detail as to how the inshore feature recoverability information was produced, using a combination of MarESA resilience scores and biogeographical information (Hiscock 2016).

The work presented in this report was undertaken using the charting progress 2 (CP2) bioregions. These divide the UK seas into eight regions based on environmental conditions used in reporting on the state of UK waters. For the offshore features, the MarESA aggregation tools use the biotopes that were assigned as 'Present' or 'Possibly present' in Tillin *et al.* (2020). The tools used for both the inshore and offshore features, therefore, provide region-specific recovery scores, based upon only the biotopes that correlate to the feature and are present or possibly present within that region. It is important to note that there are some limitations associated with the bioregional information due to the underpinning data, particularly for the 'possible' biotopes. Further detail on the limitations of this evidence source can be found within the Tillin *et al.* (2020) report.

Table 2. List of tools for assessing each feature type in the offshore and inshore bioregions.

| Location	Feature type	Tools
Inshore	MCZ Broad Scale Habitats (BSH)	Combination of MarESA extract and Hiscock (2016) biogeographical contract outputs – see Figure 1.
Inshore	MCZ Habitat Features of Conservation Importance (FOCI)	
Inshore	Annex I habitats/sub-features	
Offshore	MCZ Broad Scale Habitats (Level 3 habitats)	MarESA resilience offshore aggregation (Last *et al.* 2020; 2020 version) and MarESA Deep-sea bed BSH resilience aggregation (2020 version)
Offshore	MCZ Habitat FOCI	MarESA Offshore FOCI resilience aggregation (2020 version)
Offshore	Annex I habitats/sub-type	MarESA Offshore Annex I habitat/sub-type resilience aggregation (2020 version)
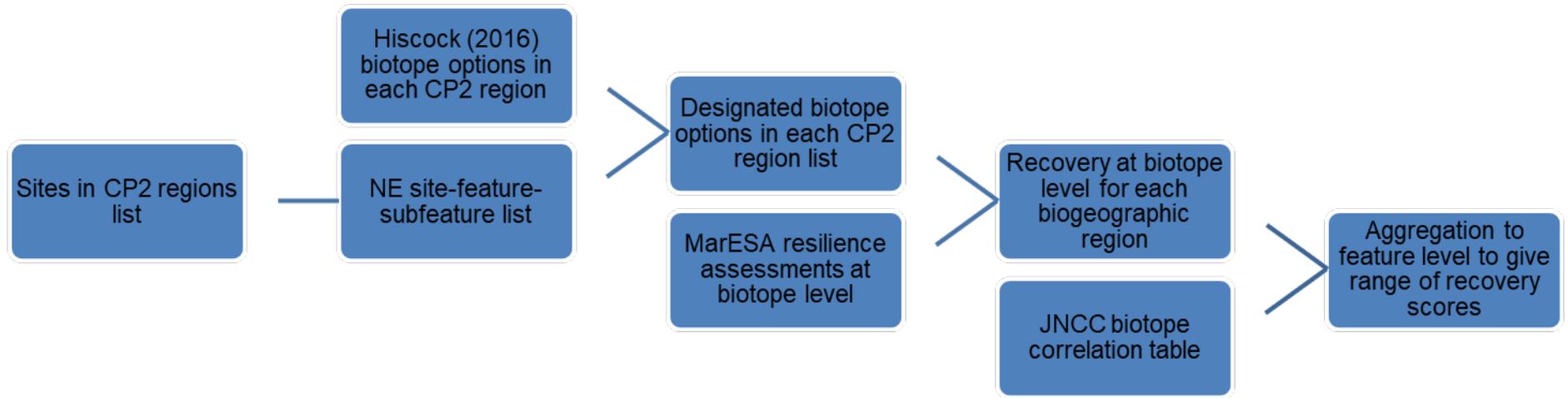
Figure 1. Flow diagram showing steps taken in this project to produce the feature-level recovery information for the inshore features.

3.3   Current Recovery Potential

By combining the current condition information (Sections 3.1) and the theoretical recovery potential (Section 3.2), as shown in Figure 2, JNCC and Natural England were able to determine the recovery potential of all MPA features listed on the schedule of the Environmental Targets (Marine Protected Areas) Regulations 2023. Features whose current condition is favourable were listed in the current recovery potential as favourable, as no recovery is required. For features whose current condition is unfavourable or not assessed, the current recovery potential is the recovery timescale identified in the theoretical recovery potential analysis. These are provided in MPA feature recovery dataset (JNCC & Natural England 2024).

Figure 2. Schematic to demonstrate how current recovery potential is calculated.

To determine the number of features likely to be in favourable condition by the target deadline in 2042, which is 18 years from 2024, the expected date for all management to be in place, we calculated the number of features expected to be favourable after 2, 6, 10, 12 and 25 years. These time points were set as based on the end point of recovery timeframes (Table 1). Table 3 shows the amalgamation of the total number and percentage of feature occurrences that are predicted to be favourable at the end of each recovery timeframe, up to 25 years. It is expected that all features will reach favourable condition at some point, if management to adequately reduce or remove pressures is in place, but how far after 25 years is unknown.

Table 3. Number and percentage of features projected to be in favourable condition at the end of each recovery timeframe.

Timeframe	Percentage of features in the network	Total number of feature occurrences
Favourable condition in 2 years	44%	508
Favourable condition in 6 years	49%	555
Favourable condition in 10 years	55%	628
Favourable condition in 12 years	71%	813
Favourable condition in 25 years	77%	880

The following tables summarise MPA feature recovery potential within the MPA target timeframe. Some features are likely to be in favourable condition by 2042 in all the sites they occur within (Table 4).

Table 4. Marine features likely to be in favourable condition by 2042.

Marine features likely to be in favourable condition by 2042	
Allis shad (*Alosa alosa*)	Light-bellied brent goose (*Branta bernicla hrota*)
Atlantic puffin (*Fratercula arctica*)	Little egret (*Egretta garzetta*)
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Littoral chalk communities
Barnacle goose (*Branta leucopsis*)	Long snouted seahorse (*Hippocampus guttulatus*)
Bar-tailed godwit (*Limosa lapponica*)	Long-tailed duck (*Clangula hyemalis*)
Black seabream (*Spondyliosoma cantharus*)	Lagoon sand shrimp (*Gammarus insensibilis*)
Black-throated diver (*Gavia arctica*)	Low energy infralittoral rock and thin sandy sediment
Common goldeneye (*Bucephala clangula*)	Mediterranean gull (*Larus melanocephalus*)
Common guillemot (*Uria aalge*)	Moderate energy intertidal rock
Common redshank (*Tringa totanus*)	Northern gannet (*Morus bassanus*)
Common seal (*Phoca vitulina*)	Northern lapwing (*Vanellus vanellus*)
Common shelduck (*Tadorna tadorna*)	Northern pintail (*Anas acuta*)
Couch's goby (*Gobius couchi*)	Pied avocet (*Recurvirostra avosetta*)
Dark-bellied brent goose (*Branta bernicla bernicla*)	Pink-footed goose (*Anser brachyrhynchus*)
Defolin's lagoon snail (*Caecum armoricum*)	Purple sandpiper (*Calidris maritima*)
Dunlin (*Calidris alpina alpina*)	Razorbill (*Alca torda*) (SPA feature)
Eurasian curlew (*Numenius arquata*)	Red knot (*Calidris canutus*)
Eurasian marsh harrier (*Circus aeruginosus*)	Red-breasted merganser (*Mergus serrator*)
Eurasian spoonbill (*Platalea leucorodia leucorodia*)	Red-throated diver (*Gavia stellata*)
Eurasian teal (*Anas crecca*)	Ringed plover (*Charadrius hiaticula*)
Eurasian wigeon (*Anas penelope*)	River lamprey (*Lampetra fluviatilis*)
European golden plover (*Pluvialis apricaria*)	Roseate tern (*Sterna dougallii*)
Giant goby (*Gobius cobitis*)	Ross worm (*Sabellaria spinulosa*) reefs
Greater scaup (*Aythya marila*)	Ruddy turnstone (*Arenaria interpres*)
Greater white-fronted goose (*Anser albifrons albifrons*)	Ruff (*Philomachus pugnax*)
Great-northern diver (*Gavia immer*)	Sanderling (*Calidris alba*)
Grey plover (*Pluvialis squatarola*)	Sea lamprey (*Petromyzon marinus*)
Grey seal (*Halichoerus grypus*)	Sheltered muddy gravels
Greylag goose (*Anser anser*)	Short snouted seahorse (*Hippocampus hippocampus*)
Harbour porpoise (*Phocoena phocoena*)	Slavonian grebe (*Podiceps auritus*)

Marine features likely to be in favourable condition by 2042	
High energy infralittoral rock	Smelt (*Osmerus eperlanus*)
High energy intertidal rock	Spiny lobster (*Palinurus elephas*)
Honeycomb worm (*Sabellaria alveolata*) reefs	Stalked jellyfish (*Calvadosia campanulata*)
Infralittoral muddy sand	Stalked jellyfish (*Calvadosia cruxmelitensis*)
Infralittoral sandy mud	Stalked jellyfish (*Haliclystus* spp)
Intertidal biogenic reefs	Subtidal biogenic reefs
Intertidal coarse sediment	Subtidal coarse sediment
Intertidal mixed sediments	Subtidal sand
Intertidal under boulder communities	Tentacled lagoon-worm (*Alkmaria romijni*)
Clacton Cliffs and Foreshore	Twaite shad (*Alosa fallax*)
North Sea glacial tunnel valleys: Swallow Hole	Celtic Sea Relict Sandbanks
Folkestone Warren (Gault Formation)	North Norfolk Coast assemblage of subtidal sediment features and habitats
English Channel Outburst Flood Features (Quaternary fluvio-glacial erosion features)	Spurn Head (subtidal) and "the Binks"
Bracklesham Bay	Haig Fras rock complex
Bouldnor Cliff geological feature	Portland Deep

There are some features which are likely to be in favourable condition in some occurrences within the network, whilst being unlikely to recover within 25 years in other occurrences (Table 5). This is because current condition calculations may be different in different locations and/or because the recovery potential varies depending on the biogeographic region the feature is found within.

Table 5. Marine features with a range of conditions expected by 2042.

Marine features with varying condition in 2042	
Arctic tern (*Sterna paradisaea*)	Mudflats and sandflats not covered by seawater at low tide
Black-tailed godwit (*Limosa limosa islandica*)	Native oyster (*Ostrea edulis*)
Blue mussel (*Mytilus edulis*) beds	Ocean quahog (*Arctica islandica*)
Coastal lagoons	Peacock's tail (*Padina pavonica*)
Coastal saltmarshes and saline reedbeds	Peat and clay exposures
Common tern (*Sterna hirundo*)	Pink sea-fan (*Eunicella verrucosa*)
Estuaries	Reefs
Estuarine rocky habitats	Salicornia and other annuals colonising mud and sand
Eurasian oystercatcher (*Haematopus ostralegus*)	Sandbanks which are slightly covered by sea water all the time
Fragile sponge and anthozoan communities on subtidal rocky habitats	Sandwich tern (*Sterna sandvicensis*)
High energy circalittoral rock	Seabird assemblage
Intertidal mud	Sea-fan anemone (*Amphianthus dohrnii*)

Marine features with varying condition in 2042	
Intertidal sand and muddy sand	Seagrass beds
Lesser black-backed gull (*Larus fuscus*)	Sea-pen and burrowing megafauna communities
Little tern (*Sterna albifrons*)	Submerged or partially submerged sea caves
Low energy infralittoral rock	Subtidal chalk
Low energy intertidal rock	Subtidal mixed sediments
Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	Subtidal mud
Moderate energy circalittoral rock	Waterbird assemblage
Moderate energy infralittoral rock	-

There are also some features that due to their extended recovery times are not likely to be in favourable condition by 2042 (Table 6), however provided management is in place they should eventually recover.

Table 6. Marine features likely to be in unfavourable but recovering condition by 2042.

Marine features likely to be in unfavourable but recovering by 2042	
Black (common) scoter (*Melanitta nigra*)	Herring gull (*Larus argentatus*)
Black-legged kittiwake (*Rissa tridactyla*)	Large Shallow Inlets and Bays
Cold-water coral reefs	Little gull (*Larus minutus*)
Common eider (*Somateria mollissima*) (MCZ feature)	Maerl beds
Common eider (*Somateria mollissima*) (SPA feature)	Moderate energy infralittoral rock and thin mixed sediment
Coral gardens	Native oyster (*Ostrea edulis*) beds
Deep-sea bed	Razorbill (*Alca torda*) (MCZ feature)
European shag (*Phalacrocorax aristotelis*)	Spartina swards (*Spartinion maritimae*)
European storm-petrel (*Hydrobates pelagicus*)	Subtidal coarse sediment and subtidal mixed sediments mosaic
Fan mussel (*Atrina fragilis*)	Subtidal macrophyte-dominated sediment
Greater black-backed gull (*Larus marinus*)	

4   Conclusion

The recovery information produced in this analysis used best available evidence and was made available to the Marine Protected Areas team within the Department for Environment, Food and Rural Affairs (Defra) in October 2021. This information was used by Defra in the determination of percentage figures for the interim target, as set out in the Environmental Improvement Plan 2023 (HM Government, 2023) and for the final statutory target, as set out in the regulation statutory instrument (UK Parliament 2023):

- *Interim target:* 48% of designated features to be in favourable condition by 31 January 2028 (HM Government 2023).

- *Final Target:* 70% of designated features in Marine Protected Areas (MPAs) to be in favourable condition by 2042 with the remainder in recovering condition (UK Parliament 2023).

Since the target was entered into law in 2023, work has begun on reporting progress towards meeting the target. This recovery analysis forms the basis of the information that will be used in future reporting, the first round of which is due in 2028.

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Appendices

Appendix I: Condition Assessment Case Studies

Please note these were written in 2021 to support target development using best available data at the time, current understanding of condition may be different and can be found on the Natural England Designated Sites Website or the JNCC's Site Information Centres (JNCC Conservation Advice can be found on the individual MPA site information centres).

Plymouth Sound and Estuaries SAC has seven marine features: two are currently assessed to be in favourable condition and five in unfavourable condition.

This assessment is based on evidence from site monitoring, data from other agencies, including water quality data and relevant scientific research. Each assessment is given a confidence score reflecting the level and quality of evidence used. If the evidence is contradictory or lacking and expert scientific judgement is required, then the assessments are checked by a senior scientist and the confidence score lowered as a result.

Seagrass has been assessed against 11 attributes, five of which did not meet their targets. The extent attribute failed, as four of the six main beds declined in area between the 2012 baseline SCUBA diving and drop-down video monitoring and the most recent surveys in 2018. Other attributes which failed included the distribution of the beds, the rhizome (root structure) health and levels of contaminants in the water. The full detail of the reasons for these failures, evidence used and confidence in the assessments is publicly available on the Natural England Designated Sites View website.

Reef is also a feature in the site. It has three sub-features, covering three depth ranges, which are assessed separately, and the assessments are then combined to produce the overall feature assessment. One of the attributes considered is species composition (i.e. is the reef home to all the species expected to be present on a healthy reef and is this consistent over time?). Statistical analysis has shown that for most of the reef the variety of species present has not changed significantly, but in one small part of the reef (in the intertidal area) there has been some decline. The feature assessment is given as a percentage of the feature area in each of the condition categories. This reef is assessed to be 99% in favourable condition and 1% is unfavourable declining condition. The threshold for favourable condition overall is 95%, so this feature gets an overall assessment of being in favourable condition.

Fulmar MCZ is located 224 km offshore of the Northumberland coast. It is designated to protect the biological communities that are considered typical of subtidal muddy and sandy sediments in the North Sea. JNCC do not have any direct evidence available of protected feature condition. They have used our understanding of the activities taking place, and the sensitivity of the protected features of the site to pressures associated with those activities, to make a judgement as to likely condition based on MCZ protocol F; a methodology that has been subject to scientific and stakeholder scrutiny.

For each protected feature of the Fulmar MCZ, JNCC have considered all available evidence, such as:

- spatial data on the protected habitats and species,

- spatial data on human activities which is available from multiple sources (e.g. UKMMAS Human Activity Spreadsheet - note that the data used for the assessment came from the April 2020 version of this spreadsheet.),

- pressures associated with human activities provided in JNCC's Pressure Activities Database (note that the version used for the assessment has since been updated),

- the nature of the human activities (e.g. their scale, duration, location and degree of spatial overlap with the protected habitat) and species' extent and distribution,

- sensitivity of the protected habitats and species to the full range of pressures which the human activities occurring can cause. This is provided by the Marine Life Information Network (MarLIN) Marine Evidence Based Sensitivity Assessments (available at MarESA).

Using the above sources of information, JNCC looked at each feature's attribute as listed in the Fulmar MCZ conservation objectives set out in the Designation Order, to assess whether they would be being impacted by ongoing activities. Where all attributes of a protected feature are assessed to be relatively unimpacted by ongoing activities, the feature is considered in favourable condition. For subtidal mud, JNCC have considered whether overlapping activities may have affected its extent and distribution, its characterising biological communities and their functioning and biological structure, and any supporting processes considered to be of importance to the subtidal mud feature, such as water quality.

JNCC's assessment concluded that known levels of activity are not occurring at sufficient levels to result in significant damage to any of the protected features of the Fulmar MCZ, so they are assessed to be in favourable condition. This process and the associated rationale is fully documented in the Fulmar MCZ Conservation Advice Package.

Appendix II: Features with sensitivity assessments conducted by APEM or NatureBureau

Feature type	Marine features	Sensitivity assessment lead
Annex I habitat	Salicornia and other annuals colonising mud and sand	NatureBureau
Annex I habitat	Spartina swards (*Spartinion maritimae*)	NatureBureau
Annex I habitat	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	NatureBureau
Annex I habitat	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	NatureBureau
Broad Scale habitat	Coastal saltmarshes and saline reedbeds	NatureBureau
FOCI species	Couch's goby (*Gobius couchi*)	APEM
FOCI species	Long snouted seahorse (*Hippocampus guttulatus*)	APEM
FOCI species	Short snouted seahorse (*Hippocampus hippocampus*)	APEM
FOCI species	Spiny lobster (*Palinurus elephas*)	APEM
Annex II species	Sea lamprey (*Petromyzon marinus*)	APEM
Annex II species	River lamprey (*Lampetra fluviatilis*)	APEM
FOCI species	Smelt (*Osmerus eperlanus*)	APEM
Non-ENG species	Black seabream (*Spondyliosoma cantharus*)	APEM
Annex II species	Twaite shad (*Alosa fallax*)	APEM
Annex II species	Allis shad (*Alosa alosa*)	APEM
Annex II species	Common seal (*Phoca vitulina*)	APEM
Annex II species	Grey seal (*Halichoerus grypus*)	APEM
Annex II species	Harbour porpoise (*Phocoena phocoena*)	APEM
Annex I species	Arctic tern (*Sterna paradisaea*)	APEM
Annex I species	Pied avocet (*Recurvirostra avosetta*)	APEM
Annex I species	Barnacle goose (*Branta leucopsis*)	APEM
Annex I species	Bar-tailed godwit (*Limosa lapponica*)	APEM
Regularly occurring migratory species	Atlantic puffin (*Fratercula arctica*)	APEM
Regularly occurring migratory species	Black (common) scoter (*Melanitta nigra*)	APEM
Regularly occurring migratory species	Northern gannet (*Morus bassanus*)	APEM
Regularly occurring migratory species	Black-tailed godwit (*Limosa limosa islandica*)	APEM
Annex I species	Black-throated diver (*Gavia arctica*)	APEM

Feature type	Marine features	Sensitivity assessment lead
Regularly occurring migratory species	Common Eider (*Somateria mollissima*)	APEM
Regularly occurring migratory species	Common goldeneye (*Bucephala clangula*)	APEM
Regularly occurring migratory species	Common redshank (*Tringa totanus*)	APEM
Regularly occurring migratory species	Common shelduck (*Tadorna tadorna*)	APEM
Regularly occurring migratory species	Common guillemot (*Uria aalge*)	APEM
Annex I species	Common tern (*Sterna hirundo*)	APEM
Regularly occurring migratory species	Dark-bellied brent goose (*Branta bernicla bernicla*)	APEM
Regularly occurring migratory species	Dunlin (*Calidris alpina alpina*)	APEM
Regularly occurring migratory species	Eursaian curlew (*Numenius arquata*)	APEM
Annex I species	Eurasian marsh harrier (*Circus aeruginosus*)	APEM
Regularly occurring migratory species	Eurasian oystercatcher (*Haematopus ostralegus*)	APEM
Annex I species	Eurasian spoonbill (*Platalea leucorodia*)	APEM
Regularly occurring migratory species	Eurasian teal (*Anas crecca*)	APEM
Regularly occurring migratory species	Herring gull (*Larus argentatus*)	APEM
Regularly occurring migratory species	Eurasian wigeon (*Anas penelope*)	APEM
Regularly occurring migratory species	European Shag (*Phalacrocorax aristotelis*)	APEM
Annex I species	European storm petrel (*Hydrobates pelagicus*)	APEM
Annex I species	European golden plover (*Pluvialis apricaria*)	APEM
Regularly occurring migratory species	Black-legged Kittiwake (*Rissa tridactyla*)	APEM
Regularly occurring migratory species	Greater scaup (*Aythya marila*)	APEM
Regularly occurring migratory species	Greater white-fronted goose (*Anser albifrons albifrons*)	APEM
Annex I species	Great northern diver (*Gavia immer*)	APEM
Regularly occurring migratory species	Grey plover (*Pluvialis squatarola*)	APEM
Regularly occurring migratory species	Greylag goose (*Anser anser*)	APEM

Feature type	Marine features	Sensitivity assessment lead
Regularly occurring migratory species	Greater black-backed gull (*Larus marinus*)	APEM
Annex I species	Little tern (*Sterna albifrons*)	APEM
Regularly occurring migratory species	Lesser black-backed gull (*Larus fuscus*)	APEM
Regularly occurring migratory species	Light-bellied brent goose (*Branta bernicla Branta bernicla hrota*)	APEM
Annex I species	Little egret (*Egretta garzetta*)	APEM
Annex I species	Little gull (*Larus minutus*)	APEM
Annex I species	Mediterranean gull (*Larus melanocephalus*)	APEM
Regularly occurring migratory species	Long-tailed duck (*Clangula hyemalis*)	APEM
Regularly occurring migratory species	Razorbill (*Alca torda*)	APEM
Regularly occurring migratory species	Northern lapwing (*Vanellus vanellus*)	APEM
Regularly occurring migratory species	Northern pintail (*Anas acuta*)	APEM
Regularly occurring migratory species	Pink-footed goose (*Anser brachyrhynchus*)	APEM
Regularly occurring migratory species	Purple sandpiper (*Calidris maritima*)	APEM
Annex I species	Roseate tern (*Sterna dougallii*)	APEM
Regularly occurring migratory species	Red knot (*Calidris canutus*)	APEM
Regularly occurring migratory species	Red-breasted merganser (*Mergus serrator*)	APEM
Annex I species	Red-throated diver (*Gavia stellata*)	APEM
Regularly occurring migratory species	Ringed plover (*Charadrius hiaticula*)	APEM
Annex I species	Sandwich tern (*Sterna sandvicensis*)	APEM
Regularly occurring migratory species	Ruddy turnstone (*Arenaria interpres*)	APEM
Annex I species	Ruff (*Philomachus pugnax*)	APEM
Regularly occurring migratory species	Sanderling (*Calidris alba*)	APEM
Annex I species	Slavonian grebe (*Podiceps auritus*)	APEM
Non-ENG species	Common Eider (*Somateria mollissima*)	APEM
Non-ENG species	Razorbill (*Alca torda*)	APEM