Supplementary Advice on Conservation Objectives for East of Haig Fras Marine Conservation Zone

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The information provided in this document sets out JNCC's supplementary advice on the conservation objectives set for East of Haig Fras Marine Conservation Zone (MCZ), hereafter referred to as 'the site'. This document forms part of JNCC's formal conservation advice package for the site and must be read in conjunction with all parts of the package as listed below:

- **Background Document** explaining where to find the most up to date version of the advice package, JNCC's role in the provision of conservation advice, how the advice has been prepared, when to refer to it and how it can be applied;
- **Conservation Objectives and Management Advice** document setting out the broad ecological aims (conservation objectives) for the site and JNCC's advice on:
    - protected feature condition;
    - conservation benefits that the site can provide if managed effectively; and
    - conservation measures that JNCC consider are required to support achievement of the conservation objectives stated for the site.
- **Advice on Operations** providing information on those human activities that, if taking place within or near the site, can impact it and hinder the achievement of the conservation objectives stated for the site.

The most up-to-date conservation advice package for the site can be downloaded from the conservation advice section of the Site Information Centre (SIC) on JNCC's website.

The advice presented in this document describes the ecological characteristics or 'attributes' of the site's protected features as specified in the site's conservation objectives listed in the 2013 Designation Order, 2016 Designation Order, and 2019 Designation Order:

- high energy circalittoral rock;
- moderate energy circalittoral rock;
- subtidal mud;
- subtidal sand;
- sea-pen and burrowing megafauna communities;
- subtidal coarse sediment;
- subtidal mixed sediments; and
- Fan mussel *(Atrina fragilis*),

These attributes include extent and distribution, structure and function and supporting processes.

Figure 1 below illustrates the concept of how a protected feature's attributes are interlinked: with impacts on one potentially having knock-on effects on another e.g. the impairment of any of the supporting processes on which a feature relies can result in changes to its extent and distribution and structure and function.

Collectively, the attributes set out in Table 1 – 4 below, along with the objectives set for each of them, describe the desired ecological condition (favourable) for the site's protected features. All attributes listed in Table 1 – 4 must be taken into consideration when assessing impacts from an activity.

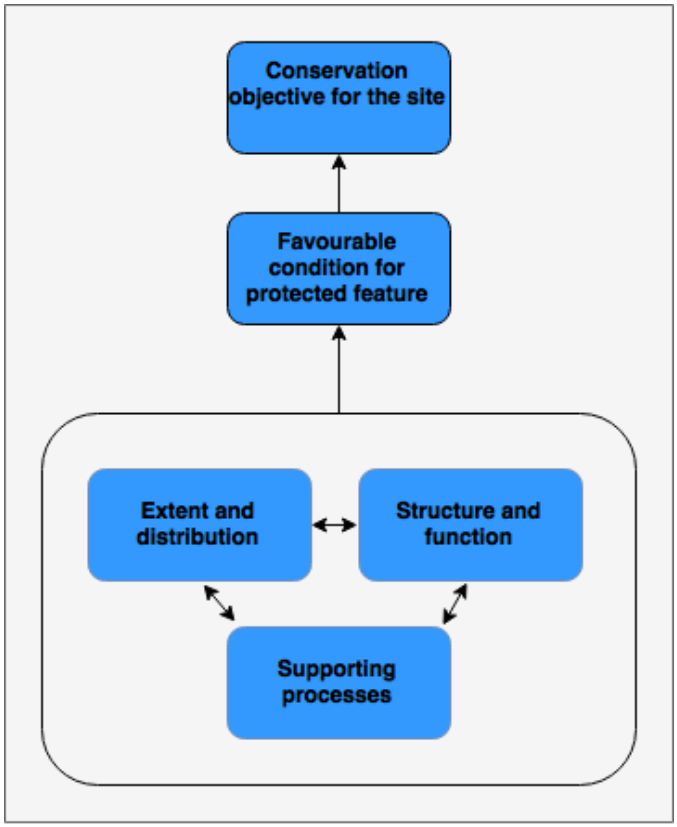

Figure 1. Conceptual diagram showing how feature attributes are interlinked and collectively describe favourable condition and contribute to the conservation objectives stated for the site.

In Table 1 – 4 below, the attributes for the high energy circalittoral rock, moderate energy circalittoral rock, subtidal mud, subtidal sand, sea-pen and burrowing megafauna communities, subtidal coarse sediment and subtidal mixed sediments mosaic and Fan mussel (*Atrina fragilis*) protected features are listed respectively. An objective of recover or maintain is set for each protected feature attribute, reflecting our current understanding of available evidence e.g. whether it indicates some of a protected feature's extent is lost and needs to be recovered or that extent is not lost and needs to be maintained to ensure the

protected feature is in overall favourable condition. Where a recover objective is advised and there is considerable uncertainty as to whether recovery is possible, this will be noted alongside the objective.

The rationale for setting an objective is provided in the summary of evidence column and supporting references listed in the reference section at the end of this document.

Note: when a maintain objective is set, this does not preclude the need for management, now or in the future to ensure a protected feature remains in favourable condition.

Table 1: Supplementary Advice on Conservation Objectives for high energy circalittoral rock and moderate energy circalittoral rock protected features of the site

In summary, the high energy circalittoral rock and moderate energy circalittoral rock protected features of the site are in unfavourable condition and need to be recovered. This conclusion is driven by evidence that suggests mobile bottom-contacting fishing practices taking place prior to the introduction of a fisheries byelaw, may have impacted upon the structure and function of the high energy circalittoral rock and moderate energy circalittoral rock protected features. Whilst a fisheries byelaw came into force in March 2024 that prohibits all mobile bottom-contacting gear from the site, the structure and function of the high energy circalittoral rock and moderate energy circalittoral rock protected features will not yet have had sufficient time to recover. Further information on activities capable of affecting the protected features of the site can be found in the Advice on Operations workbook available also in the conservation advice section of the SIC.

Attribute	Summary of evidence	View of attribute condition & objective	Confidence in attribute condition
Extent and distribution	The extent and distribution of high energy circalittoral rock and moderate energy circalittoral rock are defined by composition (particle size), energy level, and biological assemblages. Any changes to their composition, energy level, and biological assemblages bought about by human activities may impact the conservation status of the features. To the best of our knowledge there are no human activities known to be occurring which could impact the two rock features' extent and distribution and therefore advise a maintain objective.	Favourable – needs to be maintained	Low - JNCC has a baseline understanding of the extent and distribution of high energy circalittoral rock and moderate energy circalittoral rock within the site based on data from a dedicated verification survey that took place in 2013 (Eggleton & Downie, 2014) and a 2015 monitoring survey (Clare *et al.,* 2020).
Structure and function	Structure and function of high energy circalittoral rock and moderate energy circalittoral rock pertains to the physical structure itself (finer scale topography) and its biological structure (the presence of key and influential species and characteristic communities). JNCC does not consider that there is enough evidence to assess the conservation status of the key and influential species associated with the protected rock features of the site. However, JNCC conclude that the structure and function of the high energy circalittoral rock and moderate energy circalittoral rock may have been impacted by mobile bottom-contacting gear use within the site. According to Vessel Monitoring Service (VMS) data mobile bottom-contacting fishing has been occurring prior to its prohibition across the site in	Unfavourable - needs to be recovered	Low - JNCC has a baseline understanding of the structure and function of high energy circalittoral rock and moderate energy circalittoral rock within the site based on data from a dedicated verification survey that took place in 2013 (Eggleton & Downie, 2014) and a 2015 monitoring survey (Clare *et al.,* 2020). Evidence for impact is indirect, based on our understanding of the sensitivity of high energy circalittoral rock and moderate energy circalittoral rock and their associated biological communities to pressures associated with human activities

	March 2024 through the introduction of a fisheries byelaw. Mobile bottom-contacting fishing can damage and remove epifaunal species, impacting the characteristic communities of the protected rock features of the site. Whilst the fisheries byelaw came into force in March 2024 that prohibits all mobile bottom-contacting gear from across the site, removing key fishing pressures of concern (abrasion, penetration and removal of non-target species), the features' characterising communities and therefore structure and function will not yet have had sufficient time to recover. JNCC therefore advises a recover objective on this basis.		known to have taken place in the site; in this case bottom-contacting fishing gear (Tyler-Walters *et al.*, 2023 and JNCC 2018). Our information about activities within the site is incomplete e.g. our best available evidence for fishing activities only goes up to 2020 and it also cannot support an assessment of impacts from static gear fishing. The assessment is also limited by the lack of information about maintenance activities associated with cabling within the site and our lack of understanding of the key and influential species for these two features.
Supporting processes	Supporting processes with respect to high energy circalittoral rock and moderate energy circalittoral rock include hydrodynamic regime and water quality. There is no evidence to suggest that human activities are having an adverse impact on the typical hydrodynamic regime to which the site is exposed. Whilst it is noted that the Celtic Seas OSPAR region within which the site is located has been assessed to have a poor contaminant status (Larson 2022), this is insufficient evidence to assess water or sediment quality in the site. Overall, there is no evidence to suggest that supporting processes that operate at this site are being impeded with respect to supporting the conservation status of high energy circalittoral rock and moderate energy circalittoral rock. JNCC advises a maintain objective on this basis.	Favourable – needs to be maintained	Low - The evidence-base supporting JNCC's assessment against this attribute draws upon data from the wider Celtic Sea Region (Larsen *et al.*, 2022), rather than any evidence available from within, or in close proximity to the site itself. This lack of data pertaining to water quality within the site limits our assessment. Moreover, there is a lack of time series data information about water quality and on how human activities may have impacted this.

Table 2: Supplementary Advice on the Conservation Objectives for subtidal coarse sediment and subtidal mixed sediments mosaic protected feature of the site

In summary, the subtidal coarse sediment and subtidal mixed sediments mosaic protected feature of the site is in unfavourable condition and needs to be recovered. This conclusion is driven by evidence that suggests mobile bottom-contacting fishing practices taking place prior to the introduction of a fisheries byelaw may have impacted upon the extent and distribution, and structure and function, of the subtidal coarse sediment and subtidal mixed sediments mosaic protected feature of the site. Whilst a fisheries byelaw came into force in March 2024 that prohibits all mobile bottom-contacting gear from the site, the extent and distribution, and structure and function, of the subtidal coarse sediment and subtidal mixed sediments mosaic protected feature of the site will not yet have had sufficient time to recover. Further information on activities capable of affecting the protected features of the site can be found in the Advice on Operations workbook available also in the conservation advice section of the SIC.

Attribute	Summary of evidence	View of attribute condition & objective	Confidence in attribute condition
Extent and distribution	The extent and distribution of the subtidal coarse sediment and subtidal mixed sediments mosaic protected feature is defined by sediment composition and biological assemblages. Any changes to sediment composition and biological assemblages brought about by human activities may impact the conservation status of the feature. Within the site there is evidence from VMS data of demersal trawling having taken place over the entire site prior to the byelaw coming into force prohibiting its use. Whilst at relatively low levels of effort, bottom-contacting mobile fishing can alter sediment composition of the protected feature by removing coarser fractions, thereby reducing the feature's extent and distribution. Whilst a fisheries byelaw came into force in March 2024 that prohibits all mobile bottom-contacting gear from the site, the extent and distribution of the protected features will not yet have had sufficient time to recover. JNCC therefore advises a recover objective on this basis.	Unfavourable - needs to be recovered	Low - JNCC has a limited baseline understanding of the extent and distribution of the subtidal coarse sediment and subtidal mixed sediments mosaic feature within the site based on data from a dedicated verification survey that took place in 2013 (Eggleton & Downie, 2014) and a 2015 monitoring survey (Clare *et al.,* 2020). Evidence for impact is indirect, based on our understanding of the sensitivity of subtidal coarse sediment and the subtidal mixed sediments mosaic, and associated biological communities, to pressures associated with human activities known to have taken place in the site; in this case bottom-contacting fishing gear (Tyler-Walters *et al*., 2023 and JNCC, 2018). Our information about activities within the site is also incomplete e.g. our best available evidence for fishing activities only goes up to 2020 and it also cannot support

			an assessment of impacts from static gear fishing. Information is lacking regarding maintenance activities associated with cabling within the site which also limits our assessment.
Structure and function	Structure and function of the subtidal coarse sediment and subtidal mixed sediments mosaic feature pertains to the physical structure itself (finer scale topography and sediment composition) and its biological structure (the presence of key and influential species and characteristic communities). JNCC does not consider that there is enough evidence to assess the conservation status of the key and influential species associated with subtidal coarse sediment or the subtidal mixed sediments mosaic protected feature of the site. However, based on the same evidence presented under extent and distribution for this protected feature of the site, JNCC conclude that the structure and function of the subtidal coarse sediment and subtidal mixed sediments mosaic may have also been impacted.	Unfavourable - needs to be recovered	Low - JNCC has a limited baseline understanding of the structure and function of the subtidal coarse sediment and the subtidal mixed sediments mosaic within the site based on data from a dedicated verification survey that took place in 2013 (Eggleton & Downie, 2014) and a 2015 monitoring survey (Clare *et al.,* 2020). Evidence for impact is indirect, based on our understanding of the sensitivity of subtidal coarse sediment and the subtidal mixed sediments mosaic, and associated biological communities, to pressures associated with human activities known to have taken place in the site; in this case bottom-contacting fishing gear (Tyler-Walters *et al*., 2023 and JNCC, 2018). Our information about activities within the site is incomplete e.g. our best available evidence for fishing activities only goes up to 2020 and it also cannot support an assessment of impacts from static gear fishing. The assessment is also limited by the lack of information about maintenance activities associated with cabling within the site and our lack of understanding of the key and influential species for this feature.
Supporting processes	Supporting processes with respect to the subtidal coarse sediment and subtidal mixed sediments mosaic include hydrodynamic regime and water and sediment quality. There is no evidence to suggest that human activities are having an adverse impact on the typical hydrodynamic regime to which the site is exposed. Whilst it is noted that the Celtic Seas OSPAR region within which the site is located has been assessed to	Favourable – needs to be maintained	Low - The evidence-base supporting JNCC's assessment against this attribute draws upon data from the wider Celtic Sea Region (Larsen *et al*., 2022), rather than any evidence available from within, or in close proximity to, the site itself. This lack of data pertaining to water and sediment

	have a poor contaminant status (Larson 2022), this is insufficient evidence to assess water or sediment quality in the site. Overall, there is no evidence to suggest that supporting processes that operate at this site are being impeded with respect to supporting the presence of subtidal coarse sediment and the subtidal mixed sediments mosaic. JNCC advises a maintain objective on this basis.		quality within the site limits this assessment. Moreover, there is a lack of time series data information about water quality and on how human activities may have impacted this.

Table 3: Supplementary Advice on the Conservation Objectives for protected sedimentary broad-scale habitats (subtidal sand and subtidal mud) and the habitat Feature of Conservation Interest (sea-pen and burrowing megafauna communities) of the site.

In summary, the subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities protected features of the site are in unfavourable condition and need to be recovered. This conclusion is driven by evidence that suggests mobile bottom-contacting fishing practices taking place prior to the introduction of a fisheries byelaw may have impacted upon the structure and function of the subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities protected features of the site. Whilst a fisheries byelaw came into force in March 2024 that prohibits all mobile bottom-contacting gear from the site, the structure and function of the subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities protected features of the site will not yet have had sufficient time to recover. Further information on activities capable of affecting the protected features of the site can be found in the Advice on Operations workbook available also in the conservation advice section of the SIC.

Attribute	Summary of evidence	View of attribute condition & objective	Confidence in attribute condition
Extent and distribution	The extent and distribution of subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities are defined by sediment composition and biological assemblages. Any changes to sediment composition and biological assemblages brought about by human activities may impact the conservation status of the protected features. Whilst there is evidence from VMS data of demersal trawling having taken place over the entire site prior to the byelaw coming into force prohibiting its use, albeit at relatively low levels of effort and including bottom-contacting heavier gear i.e. beam trawls, pressures associated with this activity type are not considered capable of impacting the extent and distribution of these sedimentary protected features. As the only activity known to have taken place within, or in close proximity to, the site JNCC therefore advises a maintain objective.	Favourable – needs to be maintained	Low - JNCC has a limited baseline understanding of the extent and distribution of subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities within the site based on data from a dedicated verification survey that took place in 2013 (Eggleton & Downie, 2014) and a 2015 monitoring survey (Clare *et al.,* 2020). Evidence for impact is indirect, based on our understanding of the sensitivity of subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities, and their associated biological communities, to pressures associated with human activities known to have taken place in the site; in this case bottom-contacting fishing gear (Tyler-Walters *et al*., 2023 and JNCC, 2018).
Structure and function	Structure and function of subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities pertains to the physical structure itself (finer scale topography and sediment	Unfavourable - needs to be recovered	Low - JNCC has a limited baseline understanding of the structure and function of subtidal sand, subtidal mud and sea-pen

	composition) and its biological structure (the presence of key and influential species and characteristic communities). JNCC does not consider that there is enough evidence to assess the conservation status of the key and influential species associated with these three protected features of the site. However, JNCC conclude that the features' structure and function may have been impacted by mobile bottom-contacting gear in the site, which can impact the characteristic communities of all three protected features. A fisheries byelaw came into force in March 2024 that prohibits all mobile bottom-contacting gear from the site. While this removes key pressures of concern (abrasion, penetration and removal of non-target species) from the site, the features' characteristic communities and therefore structure and function will not yet have had sufficient time to recover. JNCC therefore advises a recover objective on this basis.		and burrowing megafauna communities within the site based on data from a dedicated verification survey that took place in 2013 (Eggleton & Downie, 2014) and a 2015 monitoring survey (Clare *et al.,* 2020). Evidence for impact is indirect, based on our understanding of the sensitivity of subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities, and their associated biological communities, to pressures associated with human activities known to have taken place in the site; in this case bottom-contacting fishing gear (Tyler-Walters *et al*., 2023 and JNCC, 2018). Our information about activities within the site is incomplete e.g. our best available evidence for fishing activities only goes up to 2020 and it also cannot support an assessment of impacts from static gear fishing. The assessment is also limited by the lack of information about maintenance activities associated with cabling within the site and our lack of understanding of the key and influential species for these features.
Supporting processes	Supporting processes with respect to subtidal sand, subtidal mud and sea-pen and burrowing megafauna communities include hydrodynamic regime and water and sediment quality. There is no evidence to suggest that human activities are having an adverse impact on the typical hydrodynamic regime to which the site is exposed. Whilst it is noted that the Celtic Seas OSPAR region within which the site is located has been assessed to have a poor contaminant status (Larson 2022), this is insufficient evidence to assess water or sediment quality in the site. Overall, there is no evidence to suggest that supporting processes that operate at this site are being impeded with respect to supporting the presence of subtidal sand, subtidal	Favourable – needs to be maintained	Low - The evidence-base supporting JNCC's assessment against this attribute draws upon data from the wider Celtic Sea Region (Larsen *et al*., 2022), rather than any evidence available from within, or in close proximity to, the site itself. This lack of data pertaining to water and sediment quality within this site limits this assessment. Moreover, there is a lack of time series data information about water quality and on how human activities may have impacted this.

	mud and sea-pen and burrowing megafauna communities. JNCC advises a maintain objective on this basis.		

Table 4: Supplementary Advice on Conservation Objectives for Fan mussel (*Atrina fragilis*) protected feature of the site

In summary, the Fan mussel (*Atrina fragilis*) protected feature of the site is in unfavourable condition and needs to be recovered. This conclusion is driven by evidence that suggests mobile bottom-contacting fishing practices taking place prior to the introduction of a fisheries byelaw may have impacted upon the extent and distribution, structure and function and supporting processes (specifically supporting habitat) of the Fan mussel (*Atrina fragilis*) protected feature of the site. Whilst a fisheries byelaw came into force in March 2024 that prohibits all mobile bottom-contacting gear from the site, the protected feature of the site will not yet have had sufficient time to recover. It is important to note that there is uncertainty around the feature's ability to recover due to low fecundity, slow growth rates and the unpredictability of larval recruitment in the context of the population's severe decline in the UK (MarLIN, 2025). Further information on activities capable of affecting the protected features of the site can be found in the Advice on Operations workbook available also in the conservation advice section of the SIC

Attribute	Summary of evidence	View of attribute condition & objective	Confidence in attribute condition
Extent and distribution	There are 85 records of Fan mussels found across the site, although absent from the north-west corner. Within the site there is evidence from VMS data of demersal trawling having taken place over the entire site prior to the byelaw coming into force prohibiting its use. Albeit at relatively low levels, it has been widespread and included the use of heavier beam trawls, which have the potential to impact the feature's extent and distribution by damaging and removing individuals. The key pressures of concern are abrasion, penetration and removal of non-target species. JNCC advises a recover objective on this basis, noting there is uncertainty around the feature's ability to recover due to low fecundity, slow growth rates and the unpredictability of larval recruitment in the context of the population's severe decline in the UK (MarLIN, 2025).	Unfavourable - needs to be recovered	Low - JNCC has a limited baseline understanding of the extent and distribution of Fan mussels across the site based on data from a dedicated verification survey that took place in 2013 (Eggleton& Downie, 2014) and a 2015 monitoring survey (Clare *et al.,* 2020). Evidence for impact is indirect, based on our understanding of the sensitivity of Fan mussels to pressures associated with human activities known to have taken place within the site; in this case bottom-contacting fishing gear (Tyler-Walters *et al*., 2023 and JNCC, 2018).
Structure and function	Structure of the Fan mussel population refers to the densities and age classes of individuals from a population found within a site. The function of the Fan mussel population refers to the	Unfavourable - needs to be recovered	Low – JNCC has limited understanding of the structure and function of the Fan mussel population within the site. The age

	ecological processes that the species can have a role in, which include sediment processing, secondary production, habitat modification, supply of recruits, bioengineering and biodeposition. Based on the same evidence presented above under extent and distribution, JNCC conclude that the structure, and by association function, of Fan mussels may have been adversely affected by demersal trawling occurring across the site which is capable of damaging and removing individuals. JNCC therefore advises a recover objective for structure and function on this basis but noting as per the evidence presented under extent and distribution the challenges around the recoverability of this protected feature.		structure, growth rates and reproductive viability of the population located within the site are also currently unknown. Evidence for impact is indirect, based on our understanding of the sensitivity of Fan mussels to pressures associated with human activities known to have taken place within the site; in this case bottom-contacting fishing gear (Tyler-Walters *et al*., 2023 and JNCC, 2018). Our information about activities within the site is incomplete e.g. our best available evidence for fishing activities only goes up to 2020 and it also cannot support an assessment of impacts from static gear fishing. The assessment is also limited by the lack of information about maintenance activities associated with cabling within the site.
Supporting processes	Supporting processes with respect to Fan mussels include hydrodynamic regime, supporting habitat, and water and sediment quality. There is no evidence to suggest that human activities are having an adverse impact on the typical hydrodynamic regime to which the site is exposed. Whilst it is noted that the Celtic Seas OSPAR region within which the site is located has been assessed to have a poor contaminant status (Larson 2022), this is insufficient evidence to assess water or sediment quality in the site. Fan mussel has been found in a range of sedimentary habitats within the site (subtidal sand, subtidal coarse sediment and subtidal mixed sediments mosaic, and subtidal mud). Recover objectives are being advised for the structure and function attribute for all the sedimentary protected features within the site due to exposure to damaging pressures from demersal trawling occurring in the site prior to its prohibition through the fisheries byelaw introduced in March 2024 (see Tables 2 and 3). JNCC therefore advises a recover objective for supporting processes on the basis that supporting habitats are likely to have been impacted.	Unfavourable - needs to be recovered	Low - The evidence-base supporting JNCC's assessment against this attribute draws upon data from the wider Celtic Sea Region (Larsen *et al*., 2022), rather than any evidence available from within, or in close proximity to, the site itself. A lack of data pertaining to water and sediment quality within the site itself limits this assessment. Moreover, there is a lack of time series data information about water quality and how human activities may have impacted this.

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VMS MMO internal underlying dataset variant of Fishing Activity for over 15 metre vessels which covers 2007 – 2020.