Title: Bottom Towed Fishing Gear (Prohibited Areas) Byelaw 2024 **IA No:** 1 **RPC Reference No: N/A** **Lead department or agency:** Kent and Essex Inshore Fisheries and Conservation Authority **Other departments or agencies:** MMO, Defra	Impact Assessment (IA) **Date:** 07/05/2024 **Stage:** Draft **Source of intervention:** Domestic **Type of measure:** Secondary Legislation **Contact for enquiries:** Dominic Bailey, Assistant Chief IFCO**,** Kent and Essex IFCA dominic.bailey@kentandessex-ifca.gov.uk

Summary: Intervention and Options

RPC Opinion: N/A

Cost of Preferred (or more likely) Option (in 2019 prices)			
Total Net Present Social Value	**Business Net Present Value**	**Net cost to business per year**	**Business Impact Target Status**
£0m	£0m	£0	N/A

What is the problem under consideration? Why is government intervention necessary?

The Dover to Deal Marine Conservation Zone (MCZ), the Goodwin Sands MCZ, and the Swanscombe MCZ were designated as part of the United Kingdom's Marine Protected Area Network, which aims to conserve the marine environment of the UK. Each MCZ has been assigned designated features (habitats, species, or geological attributes) that are legally protected within the site. Each designated feature is subsequently assigned a Conservation Objective, which is determined based on whether the feature is in a favourable condition or not.

The three MCZ's lie within the Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) District, and thus, under the Marine and Coastal Access Act (2009), KEIFCA have a legal duty to seek to further COs by managing fishing activities within each site. Government intervention is required to redress market failure in the marine environment by implementing appropriate management measures to conserve features and ensure negative externalities are reduced or suitably mitigated. Implementing this byelaw will support continued provision of public goods in the marine environment.

This Impact Assessment (IA) details the impact of updating the Bottom Towed Fishing Gear (Prohibited Areas) Byelaw 2017 to include a prohibition of bottom towed fishing gear use in three new areas. The existing version of this byelaw applies to six other areas. As the impact of these existing closed areas were already considered in a previous IA, they are not considered here. The IA relating to these sites can be found online at: https://www.kentandessex-ifca.gov.uk/.

What are the policy objectives of the action or intervention and the intended effects?

The policy objective of this byelaw is to further the Conservation Objectives of the Goodwin Sands MCZ, the Dover to Deal MCZ and the Swanscombe MCZ, by ensuring that designated features within each site are protected from the risk of damage by bottom towed fishing gear. The intended effects are that the potential for damage to MCZ features will be reduced and obligations under the Marine and Coastal Access Act (2009) will have been met. The economic impacts of potential management intervention will be considered with the environmental benefits in order to secure a sustainable fishery. The indicators of success will be a lack of decline in the condition of features within the MCZ. The condition of designated features within the site are required to be assessed by Natural England (NE) as part of a condition

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base).

There have been three policy options considered. These include:

- Option 0: Do nothing. KEIFCA would not be upholding its statutory duties to further (or least hinder) the Conservation Objectives of MCZs within its District.
- Option 1: Voluntary agreement for bottom towed fishing gear not to be used within the Dover to Deal MCZ, Swanscombe MCZ, and the inshore portion of the Goodwin Sands MCZ. KEIFCA believes that due to the risk of non-compliance, its statutory duties would not be upheld with this option.
- Option 2: Update the KEIFCA 'Bottom Towed Gear (Prohibited Areas) Byelaw 2017' to include the Dover to Deal MCZ, Goodwin Sands (inshore) MCZ, and Swanscombe MCZ and surrounds management areas.

The preferred option is Option 2. This will ensure Kent and Essex IFCA are upholding their legal duty to seek to further Conservation Objectives within relevant MCZs, promoting conservation of the marine environment.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 05/2029

Is this measure likely to impact on international trade and investment?		No		
Are any of these organisations in scope?	**Micro N/A**	**Small N/A**	**Medium N/A**	**Large N/A**
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)		**Traded: N/A**	**Non-traded: N/A**	

I have read the Impact Assessment, and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits, and impact of the leading options.

Signed by the responsible Chief Executive: ..... Date: .....

Summary: Analysis & Evidence Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year	Time Period	Net Benefit (Present Value (PV)) (£m)		
			Low: 0	High: -32.1	Best Estimate: 0

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0		0	**0**
High	0		3.7	**32.1**
Best Estimate	0		0	**0**

Description and scale of key monetised costs by 'main affected groups'

Costs to the fishing fleet currently active in the area from decreased potential landings cannot be estimated to a detailed level. Average annual landings by the demersal trawling and dredging fleets from the whole of both International Council for the Exploration of the Sea (ICES) rectangles (31F1 and 31F0) are £3,723,813.30 based on data from 2021 to 2023. The proposed closed areas are approximately 5% (Dover to Deal MCZ 0.3%; Goodwin Sands (inshore) MCZ 4.7%) of the sea area of 31F1 and 5.5% of the sea area of 31F0. There are potential increases in fuel and time costs for searching and fishing in new areas and potential costs of impacts from displacement of fishing effort.

It is difficult to assess the accuracy of these figures as they are a function of the landings data from the Marine Management Organisation (MMO). This landings data only quantifies landings over broad-scale ICES rectangles and fishing activity is variable on a fine-scale, meaning that these figures should be taken with low confidence.

Expert officer knowledge and Kent and Essex IFCA vessel sightings data suggest that bottom towed fishing activity is extremely low at all three sites. Thus, costs are considered to be a **significant** overestimation.

Other key non-monetised costs by 'main affected groups'

Kent and Essex IFCA proposes to work closely with other enforcement bodies such as the MMO and the Police in order to fully utilise their resources for surveillance and enforcement. These costs cannot be monetised at present as they are requested on an ad hoc bases and costs can vary.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional		Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate	0		0	**0**

Description and scale of key monetised benefits by 'main affected groups'

No monetised figures are available for the benefits of the recommended closure. However, significant potential environmental benefits are described below.

Other key non-monetised benefits by 'main affected groups'

Reducing fishing pressure by prohibiting the use of bottom towed gear in certain areas would help protect ecologically important habitats and species within each of the MCZs. This could result in the following benefits:

- Benefits to a range of fish stocks by providing protection to vital benthic habitats/communities.
- Ecosystem services associated with maintenance of a healthy ecosystem.
- Increase in environmental or fishing tourism driven by enhanced ecosystem health.
- Reduction in lost gear for fishermen using static gear in the proposed management areas.

Key assumptions/sensitivities/risks **Discount rate** 3.5%

Average annual cost estimates for the fishing industry are based on MMO landings values, which cover the whole of ICES rectangles 31F1 and 31F0, and are estimated at £3,723,813.30 (average 2021 to 2023). It is unknown what proportion of the total landings value was actually derived directly from the proposed prohibited areas, which make up 5% of ICES rectangle 31F1 and 5.5% of 31F0. Information gathered from fishers and other stakeholders during the pre-consultation period is used to support the evidence base and assumptions with the caveat that it is anecdotal evidence only. Finally, a key assumption of intervention is that it will be successful in preventing further damage to the protected features, and that the Conservation Objectives of the MCZ will be furthered.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			**Score for Business Impact Target (qualifying provisions only) £m:**
Costs: 0	**Benefits:** 0	**Net:** 0	0

Evidence Base

The evidence base for the parts of the byelaw relating to all other closed areas aside from the Dover to Deal MCZ, Goodwin Sands (inshore) MCZ, and the Swanscombe MCZ and surrounds are presented in the IA for the byelaw which preceded this management measure. This document can be found on the Kent and Essex IFCA website: https://www.kentandessex-ifca.gov.uk/.

1. Summary

1.1 Three Marine Conservation Zones (MCZs) require management of fishing activities, in order for Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA) to uphold its legal duty to seek to further Conservation Objectives (COs) at the sites. The sites include the Dover to Deal MCZ, the Goodwin Sands MCZ (inshore portion only), and the Swanscombe MCZ, all of which lie within the KEIFCA District.

1.2 All three sites contain ecologically valuable protected features with COs that are not compatible with the use of bottom towed fishing gear. At the Dover to Deal and Goodwin Sands MCZ, Ross worm (*Sabellaria spinulosa*) reef, rocky reef, and blue mussel (*Mytilus edulis*) beds provide complex habitat hosting a high biodiversity of associated fauna, including several commercial species. Due to the fragility of these habitats, they are all sensitive to any level of bottom towed fishing activity. At the Swanscombe MCZ, the nationally scarce tentacled lagoon worm plays a role in nutrient cycling as a detritivore living in muddy sediment. Low dispersal capabilities suggest that populations of the worm are vulnerable to localised disturbance.

1.3 In order to further the COs of all three sites, KEIFCA propose updating the existing Bottom Towed Gear (Prohibited Areas) Byelaw 2017 to include three new areas – the Dover to Deal MCZ, the Goodwin Sands (inshore) MCZ, and the Swanscombe MCZ and surrounds.

1.4 Pre-consultation has been somewhat restricted in this process, due to unique circumstances at each site limiting the number of appropriate options for management. However, considerable stakeholder involvement has occurred at the Goodwin Sands MCZ, with local fishermen and Non-Governmental Organisations contributing information throughout the management development process. At the Dover to Deal MCZ, flyers were handed out to relevant fishermen and authorities, and the proposed option discussed with interested parties. At the Swanscombe MCZ, a lack of commercial fishing activity resulted in no pre-consultation.

1.5 This IA has been prepared to outline the costs and benefits of the recommended management method. It also indicates why this management decision is preferred over other options. The principal purpose of this process is to ensure that KEIFCA is upholding its legal duty to seek to further the COs of designated features within each MCZ.

1.6 Data to inform this IA has been gathered from Natural England (NE), the Marine Management Organisation (MMO) statistics office, and KEIFCA records.

2. Introduction

2.1 Marine Conservation Zones in the UK

The Marine and Coastal Access Act (MaCAA) 2009, places a duty on Government to establish a network of Marine Protected Areas (MPAs). This network contributes to the conservation of the marine environment in the UK, is representative of the range of features present in the UK marine area and reflects that the conservation of a feature may require the designation of more than one site. The network includes a variety of MPAs designated under both international and national legislation. These include:

- Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), which are collectively known as European Marine Sites (EMSs)
- The marine components of RAMSAR sites
- Sites of Special Scientific Interest (SSSIs)
- Marine Conservation Zones (MCZs)

MCZs are the most recent addition to the MPA network. In England, Defra invited NE and the Joint Nature Conservation Committee (JNCC) (known collectively as Statutory Nature Conservation Bodies (SNCBs)), to make recommendations for MCZ sites. SNCBs then established four regional projects covering the English North Sea ('Net Gain'), Irish Sea ('Irish Sea Conservation Zones'), South-East coast ('Balanced Seas'), and South-West coast ('Finding Sanctuary'). This approach engaged a diverse range of stakeholders and ensured that socio-economic considerations were taken into account.
These regional projects made their recommendations in September 2011, for a combined total of 173 MCZs in 127 locations. These were reviewed by Defra, who determined that MCZ designations would be made in tranches with the best-evidenced sites designated first. Three tranches of designation followed – Tranche 1 (T1) in 2013, Tranche 2 (T2) in 2016, and Tranche 3 (T3) in 2019. Each designated site was introduced through a Marine Order and assigned legally protected habitats, species, or geological attributes, listed within the legal instrument as "features". Each feature has a CO. Each CO is either "to recover the feature to a favourable condition" (CO of RECOVER), or "to maintain the feature in a favourable condition" (CO of MAINTAIN). COs for each feature within each site are determined based on a condition assessment undertaken by NE, which will deem each feature to be in a favourable or unfavourable condition. Favourable condition concerns the spatial extent, the function, and the health of the feature.

2.2 IFCA duties

Under MaCAA, public authorities are required to exercise duties in relation to MCZ designation and management. These duties are linked to the COs contained within the designating order for each MCZ. These duties can be summarised as follows:

1. Public authorities are required to exercise their functions in a manner which best furthers (or, if not possible, least hinders) the CO of an MCZ.
2. Public authorities are required to consider the effect of proposed activities on MCZs before authorising them, and appropriately manage activities that may have a significant risk of hindering the CO of an MCZ.
3. SNCBs may give conservation advice in relation to MCZs to public authorities and are obliged to give that advice should an authority request it.

Inshore Fisheries and Conservation Authorities (IFCAs) are public bodies designated under MaCAA. There are ten IFCAs across England, each responsible for a region of the coastline out to six nautical miles from the mean high-water mark, based on 1983 fisheries baselines (referred to as the 6nm limit from now on). IFCAs are responsible for the management of the exploitation of sea fisheries resources within their District (MaCAA Section 153). They must also seek to ensure that the COs of any MCZ within that District are furthered (MaCAA Section 154).

2.3 MCZs considered in this Impact Assessment

In this Impact Assessment (IA), three MCZs are considered for management (Figure 1), as they are located within the KEIFCA District. These include the Dover to Deal MCZ (Figure 2), the Goodwin Sands MCZ (Figure 3), and the Swanscombe MCZ (Figure 4).

The Dover to Deal MCZ was designated in 2016 as part of T2, with additional features added to the site as part of T3 designations. This site lies entirely within the KEIFCA District, and thus KEIFCA are responsible for seeking to further the COs at the site (Annex I).

The Goodwin Sands MCZ was designated in 2019 as part of T3 and lies only partially within the KEIFCA District. Therefore, KEIFCA is responsible for seeking to further COs of the portion of the site that lies **inshore** of the 6nm limit (Annex II). This IA only considers this portion of the site. The Marine Management Organisation (MMO) has conducted an assessment [1] for the offshore portion of the site, the result of which was the implementation of a byelaw [2] restricting bottom towed fishing activity in parts of the offshore portion of the site.

The Swanscombe MCZ was designated in 2019 as part of T3. This site lies entirely within the KEIFCA District, and thus KEIFCA are responsible for seeking to further the COs at the site (Annex III).

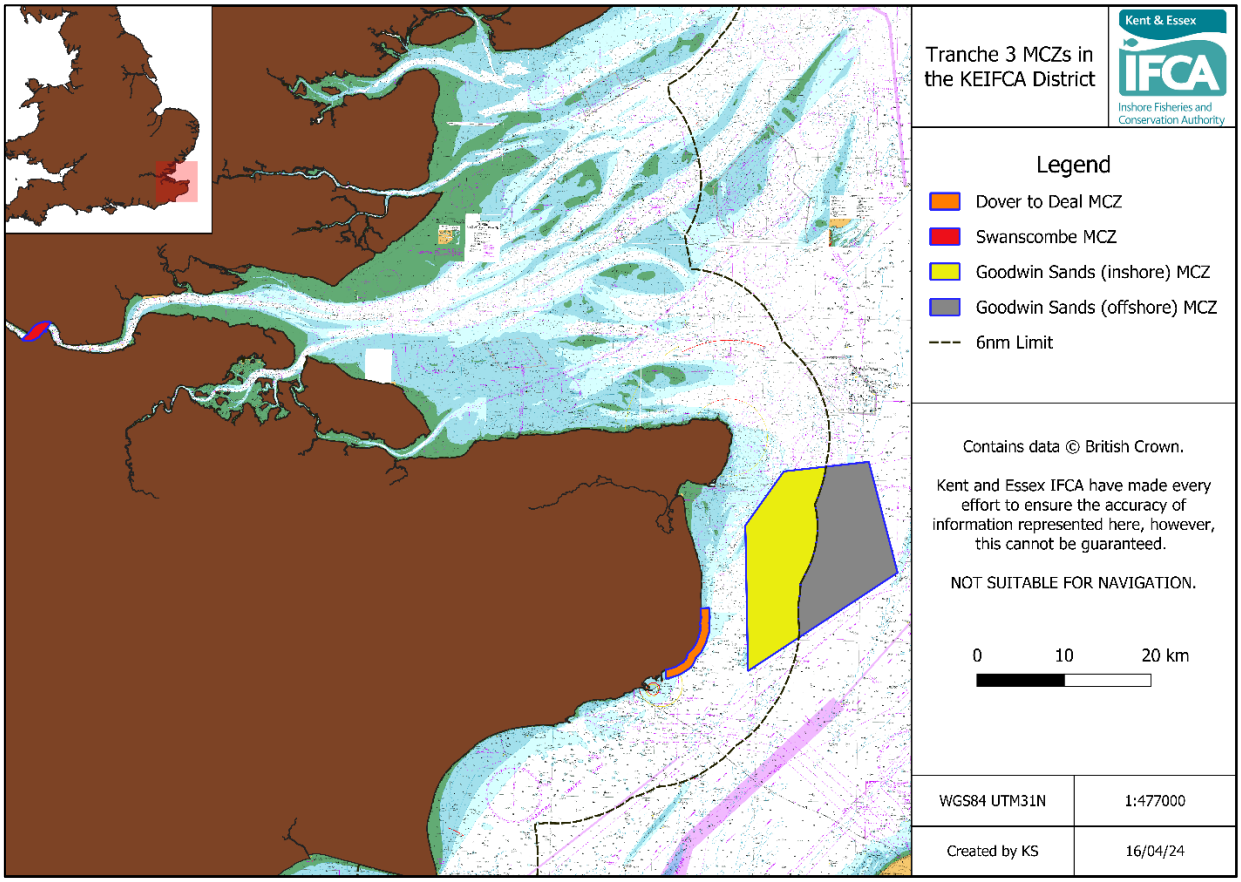

Figure 1: Dover to Deal, Goodwin Sands and Swanscombe MCZ locations within the KEIFCA district.

Utilising conservation advice from appropriate SNCBs, an assessment was undertaken by KEIFCA for each of the three sites, to determine the effect of commercial fishing activities on the COs. All three assessments determined that bottom-towed fishing activity was not compatible with the RECOVER COs for the Dover to Deal MCZ and Goodwin Sands MCZ, and the MAINTAIN COs for the Swanscombe MCZ.

KEIFCA is charged, in line with MaCAA, with managing bottom-towed gear in all three sites, in order to best further COs. By updating the Bottom Towed Fishing Gear (Prohibited Areas) Byelaw 2017 to include management of these sites, KEIFCA will seek to fulfil its statutory duties.

[1] **MMO Stage 2 Fisheries Assessment:** https://assets.publishing.service.gov.uk/media/65bb6d8a3e26be000de47e2c/MMO_Stage_2_DMA_.pdf
[2] **MMO MPA Bottom Towed Fishing Gear Byelaw 2023:** https://assets.publishing.service.gov.uk/media/65bb6a79c4734a000dd6cb78/Marine_Protected_Areas_Bottom_Towed_Fishing_Gear_Byelaw_20231.pdf

3. Rationale for Intervention

MaCAA provides a framework for managing the demands put on our seas. It aims to ensure a clean, healthy, safe, productive, and biologically diverse marine environment, by putting in place effective systems for delivering sustainable development of marine and coastal spaces.

3.1 Marine Policy Statement

The Marine Policy Statement (MPS) is the framework for making decisions affecting the marine environment and contributes to the achievement of sustainable development in the United Kingdom. It has been prepared and adopted for the purposes of Section 44 of MaCAA. Management of bottom towed fishing activity within the Dover to Deal, Goodwin Sands, and Swanscombe MCZs seeks to align with the MPS in the following ways:

- *Achieving a sustainable marine economy* – protecting habitat important to a number of commercial species, allowing fish stocks to flourish in the wider region, providing more fruitful fishing grounds for the local economy.
- *Ensuring a strong, healthy, and just society* – supporting the local fishing economy is vital as it plays a key role in coastal communities.
- *Living within environmental limits* – protecting essential habitat and communities from trawling damage.
- *Promoting good governance* – KEIFCA are implementing clear, timely and proportionate regulation. Relevant stakeholders are consulted to ensure that all views are considered throughout the decision-making process.
- *Using sound science responsibly* – best available evidence is used to inform the byelaw making process.

3.2 Defra's 25-Year Plan to Improve the Environment

Defra's 25-year plan describes a strategy for the future of fisheries and the marine environment in the UK and emphasises the need for sustainably exploited natural resources to allow long term benefits. The objectives are associated with those of the proposed byelaw:

- Reversing the loss of marine biodiversity and, where practicable, restoring it.
- Increasing the proportion of protected and well managed seas, and better managing existing protected sites.
- Ensuring seafloor habitats are productive and sufficiently extensive to support healthy, sustainable ecosystems.

3.3 Market Failure

Fishing activities can potentially cause negative outcomes as a result of market failures. These failures can be described as:

- Public goods and services – a number of goods and services provided by the marine environment (such as biological diversity) are 'public goods'. Public goods are non-excludable and non-rival, meaning no one can be excluded from benefiting from the goods, and the use of the goods does not diminish the availability of the goods to others. The characteristics of public goods, being available to all but belonging to no one, mean that individuals do not have an incentive to voluntarily ensure the continued existence of these goods which can lead to under protection/provision.
- Common goods - a number of goods and services provided by the marine environment such as populations of wild fish are 'common goods'. Common goods are non-excludable but rival, meaning no one can be excluded from benefiting from those goods, however, consumption of the goods **does** diminish the availability of the goods to others. The characteristics of common goods (being available but belonging to no one, and of a diminishing quantity), mean that individuals do not necessarily have an individual economic incentive to ensure the long-term existence of these goods which can lead, in fisheries terms, to potential overfishing. Furthermore, it is in the interest of each individual to catch as much as possible as quickly as possible so that competitors do not take all the benefits. This can lead to an inefficient amount of effort and unsustainable exploitation

- Negative externalities – negative externalities occur when the cost of damage to the marine environment is not fully borne by the users causing the damage. In many cases no monetary value is attached to the goods and services provided by the marine environment, and this can lead to more damage occurring than would occur if the users had to pay the price of damage. Even for those marine harvestable goods that are traded (such as wild fish), market prices often do not reflect the full economic cost of the exploitation or of any damage caused to the environment by that exploitation.

KEIFCA byelaws aim to redress these sources of market failure in the marine environment through the following ways:

- Management measures to support continued existence of public goods in the marine environment, for example conserving the range of biodiversity in the sea of the District.
- Management measures to support continued existence of common goods in the marine environment, for example ensuring the long-term sustainability of fish stocks in the District.
- Management measures to reduce negative externalities by imposing a legal standard of behaviours, for example ensuring that overfishing or damaging fishing practises do not take place in the District.

4. Policy Objective and Intended Effects

The policy objective pertinent to this IA is to further the COs of the Dover to Deal MCZ (Annex I), the Goodwin Sands MCZ (Annex II), and the Swanscombe MCZ (Annex III). This will be achieved by ensuring that vulnerable features within each site are protected from the risk of damage from bottom towed gear activities.

The COs of these sites (taken from the respective Marine Orders [3, 4, 5]) are:

(1) (a) so far as already in favourable condition, remain in such condition (MAINTAIN), and

(b) so far as not already in favourable condition, be brought into such condition, and remain in such condition (RECOVER).

(2) In paragraph (1), “favourable condition”—

(a) with respect to a habitat within the Zone, means that—

(i) its extent is stable or increasing, and

(ii) its structure and functions, its quality, and the composition of its characteristic biological communities are such as to ensure that it remains in a condition which is healthy and not deteriorating;

(b) with respect to a species of marine fauna within the Zone, means that the quality and quantity of its habitat and the composition of its population in terms of number, age and sex ratio are such as to ensure that the population is maintained in numbers which enable it to thrive.

[3]Dover to Deal MCZ Marine Order: https://www.legislation.gov.uk/ukmo/2016/5/pdfs/ukmo_20160005_en.pdf
[4]Goodwin Sands MCZ Marine Order: https://www.legislation.gov.uk/ukmo/2019/18/pdfs/ukmo_20190018_en.pdf
[5]Swanscombe MCZ Marine Order: https://www.legislation.gov.uk/ukmo/2019/46/pdfs/ukmo_20190046_en.pdf

5. Background

5.1 Site details

5.1.1 Dover to Deal MCZ

The Dover to Deal MCZ (Figure 2) was designated for twelve features in 2016, all of which were deemed to be in a favourable condition, and therefore assigned a CO of MAINTAIN (Annex I). These MAINTAIN features include intertidal underboulder habitat, which creates sheltered refuges for a variety of animals, and are used by crabs, fish, and young lobsters as scavenging grounds (DEFRA, 2019a). The MCZ also protects littoral chalk communities, including excellent examples of wave-cut chalk platforms (DEFRA, 2019a). The chalk foreshore at St. Margaret's Bay is recognised as supporting one of the richest algal communities in the region (DEFRA, 2019a).

In 2019, four additional features were designated at the site, including blue mussel (*Mytilus edulis*) beds, Ross worm (*Sabellaria spinulosa*) reefs, moderate energy circalittoral rock, and high energy circalittoral rock. All four additional features were deemed to be in an unfavourable condition, and therefore have a CO of RECOVER (Annex I). Ross worm reefs and blue mussel beds provide biogenic habitat for a range of marine fauna (DEFRA, 2019a). The presence of Ross worm reef on chalk is extremely rare, and within the Dover to Deal MCZ, Ross worm reef is thought to seed more vulnerable reefs offshore (DEFRA, 2019a). This site has a particularly diverse range of designated features, and thus it is important that management addresses the wider seascape to ensure site integrity, rather than managing each feature individually.

The site is subject to low levels of fishing activity, primarily crab and lobster potting. Historically, mussel dredging occurred at the site, but in the past five years KEIFCA have not recorded any bottom towed fishing activity.

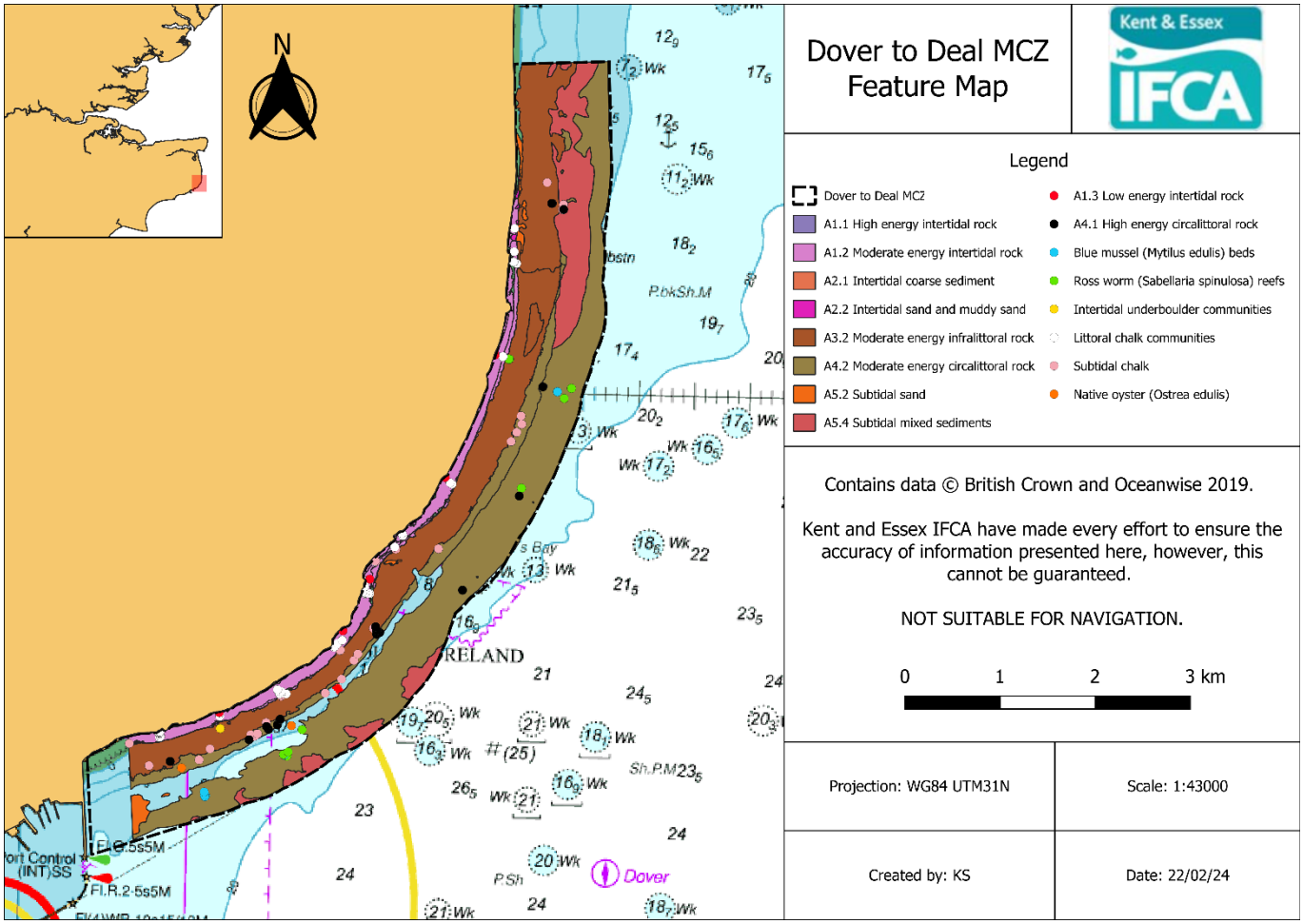

Figure 2: Dover to Deal MCZ feature map. Native oyster (*Ostrea edulis*) data was provided by Natural England in 2019. All other data provided by Natural England in 2023.

5.1.2 Goodwin Sands MCZ

In May 2019, the Goodwin Sands MCZ (Figure 3) was designated under MaCAA. There are six designated features at the site, three of which were deemed to be in a favourable condition and therefore have a CO of MAINTAIN (Annex II). The other three features include blue mussel beds, Ross worm reef, and moderate energy circalittoral rock, and were deemed to be in an unfavourable condition and assigned a CO of RECOVER (Annex II).

The MCZ is named after the Goodwin Sands, a large and dynamic series of sandbanks composed of sand and coarse sediment that are regularly exposed at low tide, providing an important haul out site for seals, and good foraging grounds for bird species (DEFRA, 2019b). Around the exposed areas of sand, deeper areas of subtidal coarse sediment are known to be of particularly high biodiversity (DEFRA, 2019b). The areas of sand and sediment protected by the Goodwin Sands MCZ are all subtidal, rather than the regularly exposed sandbanks themselves. Ross worm reefs and blue mussel beds, are highly biodiverse and valuable habitat, both of which are dependent on the underlying sediment (DEFRA, 2019b). Although subtidal sand and subtidal coarse sediment have a general management approach of MAINTAIN, the importance of these features to the health of other designated features at the site means that it is vital that degradation of these features does not occur. Moderate energy circalittoral rock, which is animal-dominated rock found on deeper or shaded vertical rock faces is also protected, along with English Channel outburst flood features which is evidence of a mega flood that occurred 200,000 years ago (DEFRA, 2019b).

The inshore portion of this site is subject to low levels of fishing activity, primarily whelk potting and gill netting. Historically, trawling and mussel dredging occurred at the site, but in the past five years KEIFCA have not recorded any bottom towed fishing activities.

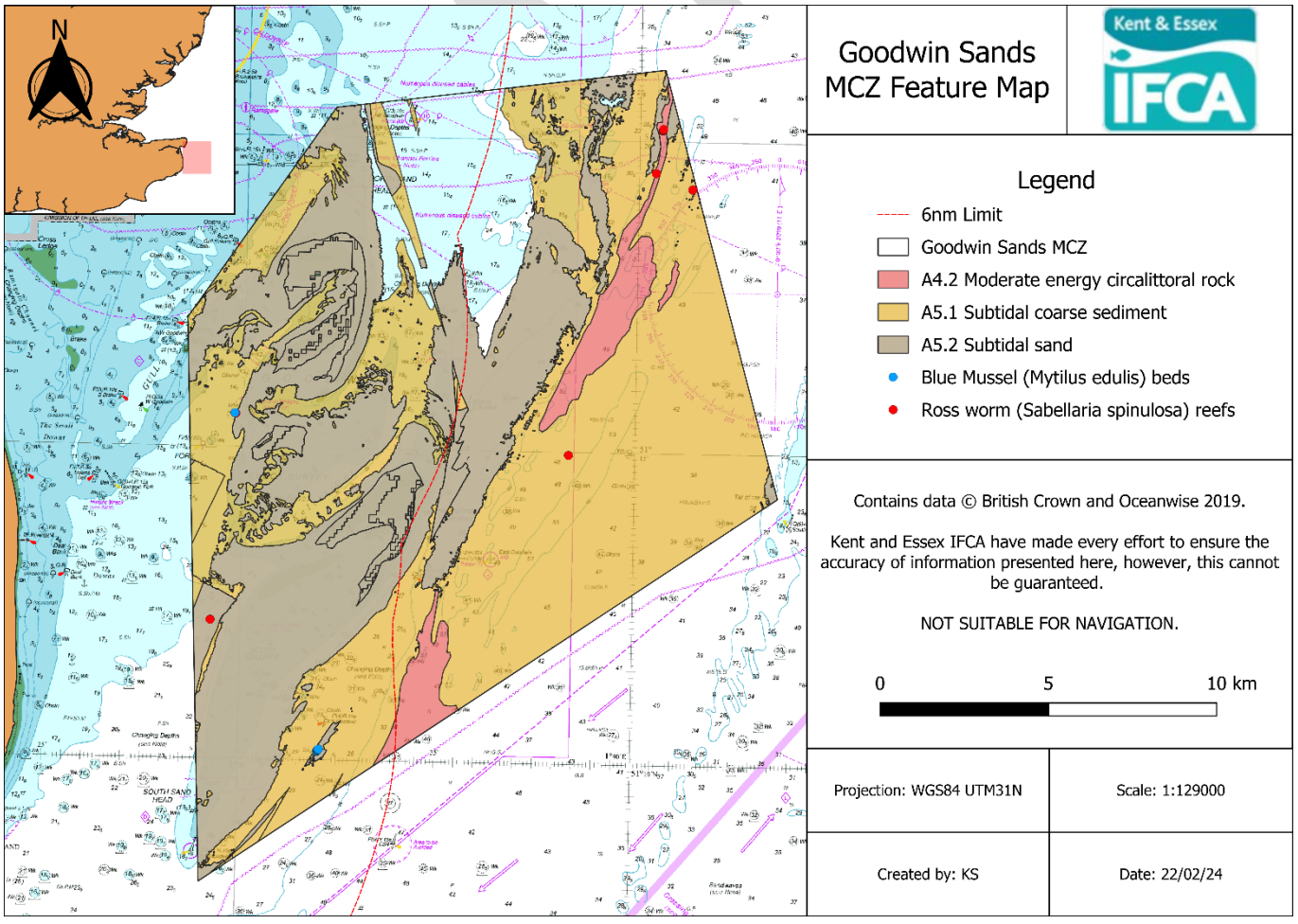

Figure 3: Goodwin Sands MCZ feature map. Data provided by Natural England in 2023.

5.1.3 Swanscombe MCZ

In May 2019, the Swanscombe MCZ (Figure 4) was designated under MaCAA. The site has two features designated for protection; intertidal mud and tentacled lagoon worm (*Alkmaria romijni*), both of which were deemed to be in a favourable condition and therefore have a CO of MAINTAIN.

The seabed of the Swanscombe MCZ is composed largely of shells, pebbles, sands, and mud (DEFRA, 2019c). The site is designated for intertidal mud, which provides important feeding grounds for wading birds (DEFRA, 2019c). The site also supports the nationally scarce tentacled lagoon worm (*A. romijni*), which is a surface deposit feeder measuring around 3-5mm that lives within sediment in durable mud tubes that protrude above the sediment surface (Chaouti and Bayed, 2006; Tyler-Walters and White, 2017). Tentacled lagoon worms have poor dispersal capabilities, and thus form discrete populations that are vulnerable to local disturbance (Chaouti and Bayed, 2006; DEFRA, 2019c; Tyler-Walters and White, 2017).

The site is already afforded a level of protection by an inherited Environment Agency (EA) byelaw that prohibits trawling upstream of a line between Coalhouse Fort in Essex, and Cliffe Fort in Kent (Figure 5). This byelaw was instated with the aim of protecting valuable nursery grounds for commercial species such as smelt, bass and Dover sole, along with protection of migratory freshwater fish (T. Cousins, personal communication).

KEIFCA have not recorded any commercial fishing activity at the site in the last five years. The area is a major shipping and navigational channel serving London ports, which limits fishing activity along with the existing trawl net ban. Shore-based angling occurs from the banks of the site.

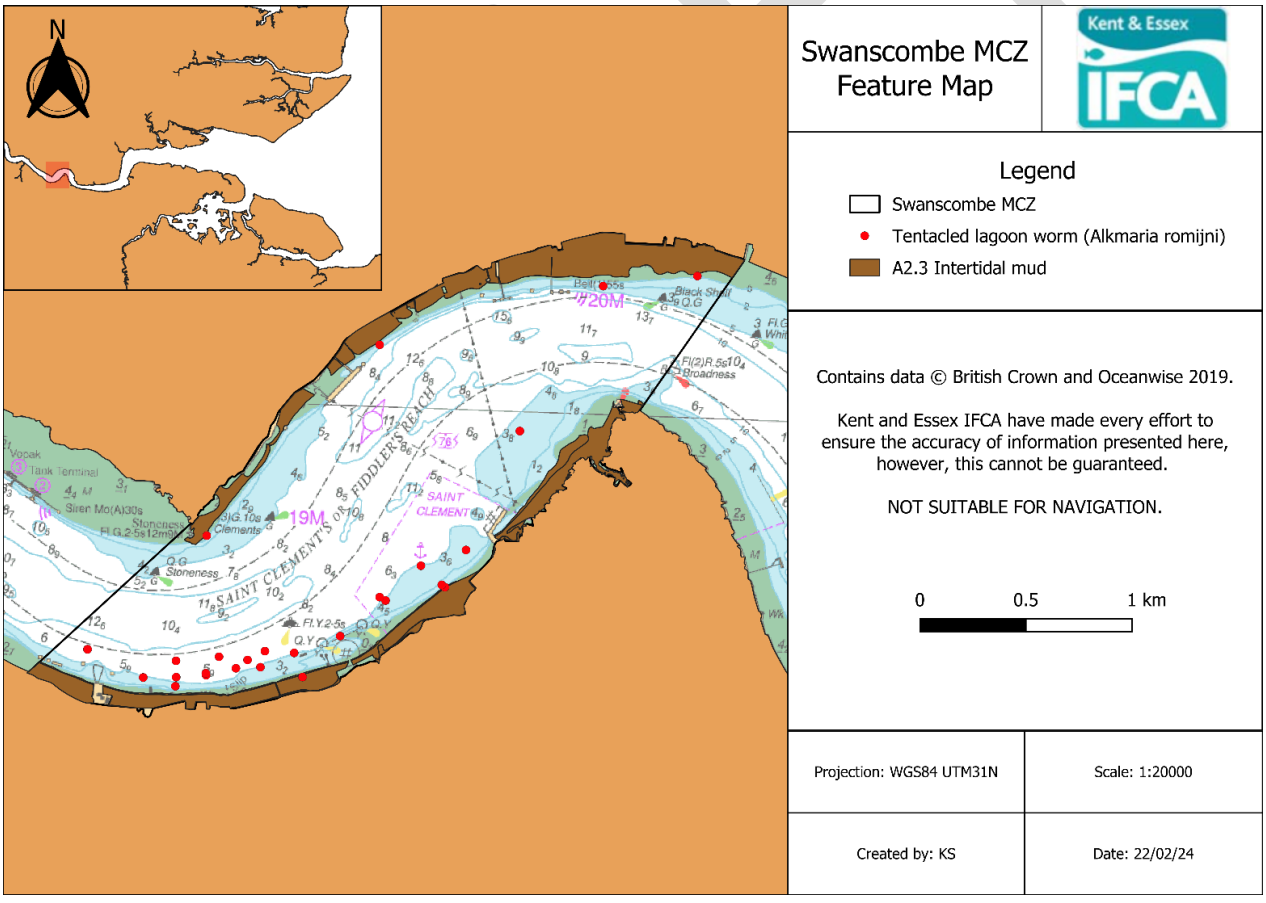

Figure 4: Swanscombe MCZ feature map. Data provided by Natural England in 2023.

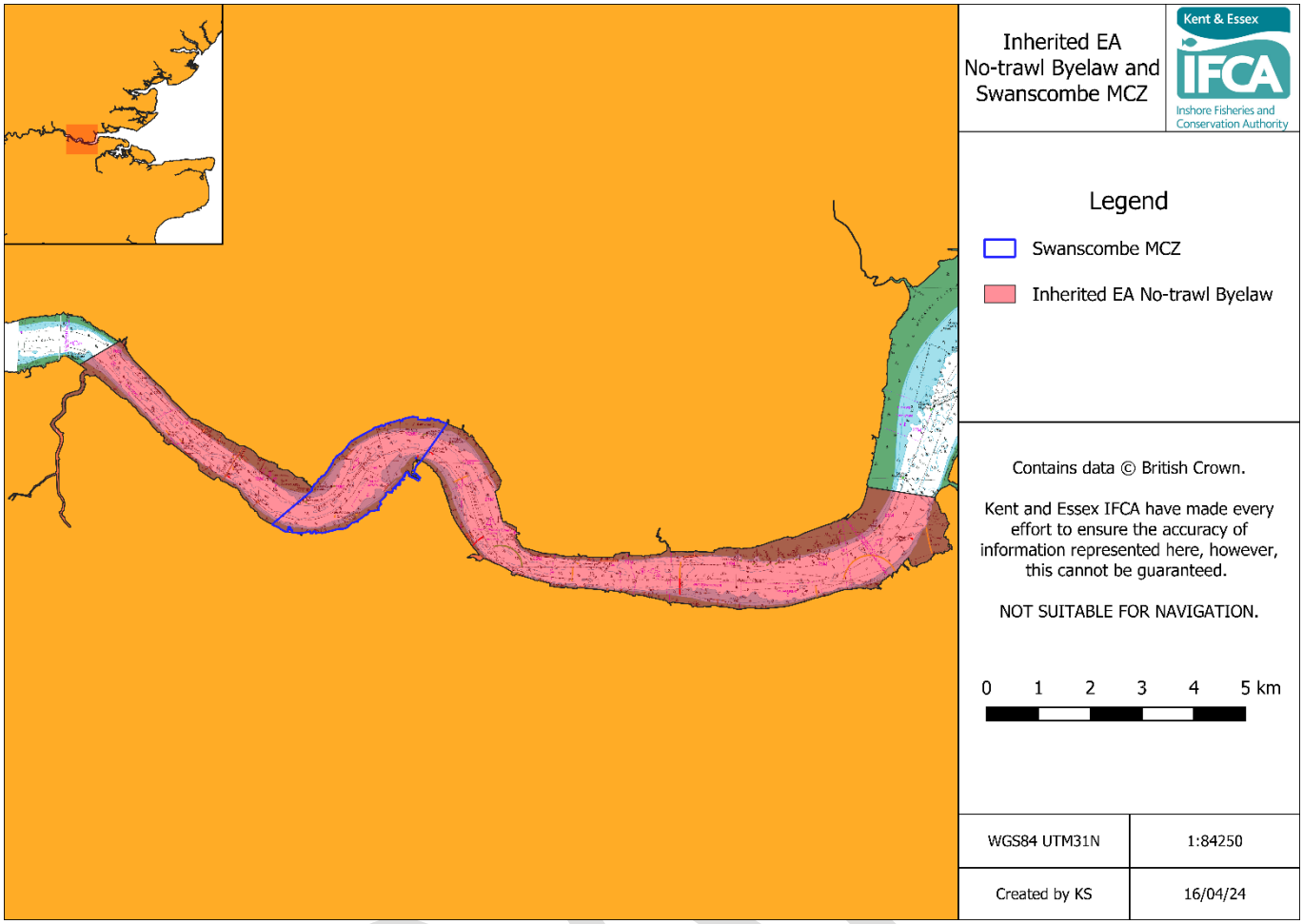

Figure 5: Inherited EA no-trawl byelaw extent and Swanscombe MCZ boundary.

5.2 Environmental value of designated features

5.2.1 High/moderate energy circalittoral rock

High energy and moderate energy circalittoral rock are defined as rocky reef exposed to high and moderate energy wave/tidal action respectively (JNCC, 2022). High energy circalittoral rock is characterised by sponges, soft corals, hydroids, and barnacles (JNCC, 2022). Moderate energy circalittoral rock hosts a broad range of species, some of which include blue mussel beds, Ross worm reefs, and mixed faunal turfs (JNCC, 2022). Both of these reef communities are structured by the presence of bedrock/boulders and the level of energy that they are exposed to (JNCC, 2022).

Rocky reefs are biodiverse, productive ecosystems that have significant ecological and commercial value (Diesing et al., 2009; Rees et al., 2014). The physical structure of rocky reef is often architecturally complex (Diesing et al., 2009; Rees et al., 2014). Hard substrate provides an attachment point for a range of algae and attached sessile epifauna, the presence of which enhances this complexity further (Diesing et al., 2009; Rees et al., 2014). Habitat complexity provides a greater number of niches for exploitation, which drives a high level of biodiversity and biomass (Diesing et al., 2009; Rees et al., 2014). This results in reef ecosystems being highly productive. Further, complex reef habitat provides protection from both predation and natural disturbance (such as storms or strong tides), creating valuable nursery habitat, and a hotspot of larval settlement (Diesing et al., 2009; Rees et al., 2014). The biological and physical resources provided by rocky reef habitat may benefit several commercial species, increasing stock biomass and thus contributing to the sustainability of surrounding fisheries (Diesing et al., 2009; Rees et al., 2014).

5.2.2 Blue mussel (M. edulis) beds

Blue mussel beds are dense aggregations of *M. edulis* individuals that form biogenic reef habitat through attaching to one another and the substrate by byssus threads (JNCC, 2022; Tillin et al., 2014). They support a wide range of red and green turf seaweeds, suspension feeders such as barnacles and polychaetes, along with limpets, dogwhelks and small crabs (JNCC, 2022; Tillin et al., 2014).

Blue mussel beds are associated with high biodiversity (Dolmer et al., 1999; Frandsen et al., 2015; Norling and Kautsky, 2008; Tillin et al., 2014). The increase in biodiversity of the mussel bed habitat compared to surrounding habitat is dependent on the surrounding habitat (Norling and Kautsky, 2008; Tillin et al., 2014). On sediments, blue mussel beds provide a hard attachment point, stabilise the sediment, and generate habitat complexity (Norling and Kautsky, 2008; Tillin et al., 2014). This leads to significant habitat modifications that result in mussel beds in sedimentary habitat being regarded as “islands” of biodiversity that host significantly different communities to habitats surrounding it (Norling and Kautsky, 2008). On hard substrate, beds generate habitat complexity and provide an alternative food resource (Tillin et al., 2014). This results in higher biodiversity, but a community that is largely similar to those found on surrounding rock (Tillin et al., 2014). Increased biodiversity in blue mussel beds is driven by interstitial spaces between individuals and between byssal threads, which provide shelter of a range of sizes, supplying a wide range of niches for colonisation by a wide range of species (Frandsen et al., 2015; Tillin et al., 2014). Further, mussel beds act as a food source for a number of animals, including starfish, crabs, demersal fish, dog whelks, and birds (Tillin et al., 2014). Mussel larvae in the water column surrounding mussel beds comprise a significant proportion of the zooplankton community, providing another important feeding resource (Tillin et al., 2014).

5.2.3 Ross worm (S. spinulosa) reef

Ross worms use sediment in the water column to build protective tubes within which they reside (Pearce, 2017). Ross worm reefs are formed when multiple generations of individuals settle on top of one another, generating highly complex, fragile structures (Gravina et al., 2018; Pearce, 2017). Worms will initially colonise coarse substrate, then, if environmental conditions are appropriate, settlement on existing adult tubes will occur (Lisco et al., 2021). Ross worm reef supports a diverse range of fauna, primarily composed of crustaceans. Ross worm reefs are characteristically patchy, and although a reef may persist in an area for many years, individual clumps will regularly form and disintegrate (Gravina et al., 2018). A complex interplay of natural and anthropogenic influences determine the natural variability of Ross worm reef (Lisco et al., 2017; Pearce, 2017). Natural variability is thought to be driven primarily

by hydrodynamics, which influences sediment supply for tube-building material, nutrient supply, larval supply for reef maintenance, and the removal of metabolic waste (Lisco et al., 2017; Pearce, 2017). Therefore, as environmental conditions change, Ross worm reef extent, relief, and quality fluctuates (Gravina et al., 2018; Lisco et al., 2017; Pearce, 2017). Ross worm is also naturally variable due to an annual cycle of growth and repair (Pearce, 2017). Juveniles grow rapidly until they reach sexual maturity after approximately one year, after which growth rate decreases drastically (Pearce, 2017). Therefore, during spring/summer, when juvenile settlement is high, reef extent expands, and during winter, when settlement is reduced, reefs degrade with strong currents or storms. Reef growth and maintenance thus relies on larval supply (Pearce, 2017).

Ross worm reef enhances biodiversity, increases food availability, provides nursery habitat, and stabilises sediments (Gravina et al., 2018; Lisco et al., 2017, 2021; Pearce, 2017). The complexity of ross worm reef provides an array of microhabitats, suitable for the settlement of a wide range of organisms (Gravina et al., 2018). Thus, Ross worm reef is a biodiversity hotspot, increasing species richness, abundance, and biomass compared to sedimentary habitats surrounding patches of reef (Gravina et al., 2018; Lisco et al., 2017; Pearce, 2017). Further, both hard substrate and soft substrate associated fauna can colonise Ross worm reef (Gravina et al., 2018). Hard substrate fauna are attracted to the tubes, and soft substrate fauna can colonise sand-filled interstitial space (Gravina et al., 2018). Ross worm reef also provides food for a range of species, particularly demersal fish. Demersal fish switch prey when Ross worm reef is present, suggesting that the worms themselves and fauna associated with the reef are a preferential food source (Pearce, 2017). Ross worm reef is a crucial nursery habitat, with structural complexity providing significant protection from predation (Pearce, 2017). Finally, Ross worm reef consolidates mobile sediments by tube-building activity, stabilising sediments and contributing to the reduction of coastal erosion (Gravina et al., 2018; Lisco et al., 2017; Pearce, 2017).

5.2.4 Tentacled lagoon worm (A. rominji)

Tentacled lagoon worm is a detritivore, feeding on organic matter and playing a key role in nutrient cycling (Chaouti and Bayed, 2006; Tyler-Walters and White, 2017). Deposit feeding marine worms are known to have a great influence on the chemical conditions of sediments, including the transfer of nitrogen and carbon between the water column and sediment (Jumars et al., 2015; Wilson et al., 1993). This nutrient cycling is essential to the health of the subtidal and intertidal mud ecosystem of the Swanscombe MCZ. Furthermore, it is classified as a nationally scarce species in the UK, only found in 27 locations around the nation, however this may be due to data deficiencies and under-recording related to its size (Tyler-Walters and White, 2017).

5.3 Environmental impact of bottom towed fishing gear

Bottom towed fishing gear use is known to cause damage to both soft substrate and hard substrate habitat and associated fauna, with evidence of long-term impacts on community structure and biodiversity in both seabed types (Blampied et al., 2022; Kenchington et al., 2001; Sheehan et al., 2013; Tuck et al., 1998). Many elements of demersal trawl gear may come into direct contact with the seabed during some or all of the fishing period, including the ground gear, sweeps, warps, doors, and parts of the net bag (Jones, 1992) (Figure 6). This results in multiple effects on the benthos, including scraping and ploughing, sediment re-suspension, and physical destruction or removal of non-target species (Jones, 1992; Nilsson and Rosenberg, 2003).

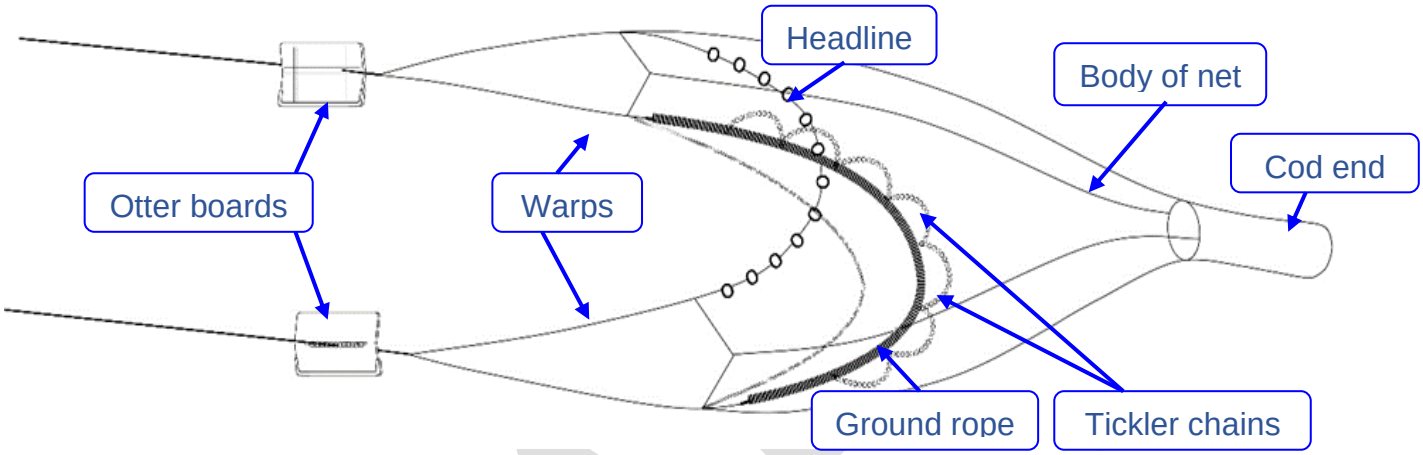

Figure 6: Schematic of the elements of an otter trawl

Hard substrate habitats are vulnerable to damage from bottom towed fishing gear, primarily due to the presence of erect, sometimes fragile structure and the generally slow-growing, stable community associated with hard substrate (Sheehan et al., 2013). Hard substrate environments are structurally complex and relatively undisturbed habitats, with many slow-growing, sessile organisms that are not adapted to withstand disturbance or subsequently re-colonise disturbed habitat (Sheehan et al., 2013). Therefore, hard substrate communities tend to shift to fast-growing scavengers when subject to intense anthropogenic disturbance (Sinclair et al., 2002). Structural complexity of hard substrate habitat is reduced when impacted by bottom towed gear, as erect, sessile organisms are removed, and hard structures are destroyed (Blampied et al., 2022). This reduces the quality of ecosystem benefits derived from complex habitat (Blampied et al., 2022; Sheehan et al., 2013).

Sedimentary habitats are considered to be less sensitive to bottom towed gear activity than structured habitats, however, detectable impacts still occur. Sedimentary habitats (sand in particular) are characterised by small-scale, low relief topographic features (Grieve et al., 2014; Kaiser et al., 2002). Demersal towed gear has been shown to create much greater topographic relief than is normally present in these habitats in the form of furrows, whilst the sediment disturbance caused both by gear penetration and turbulence resulting from its passing flattens out small-scale topography, reducing the habitat complexity (Grieve et al., 2014; Kaiser et al., 2002; Tuck et al., 1998). This, along with removal, death and damage of associated fauna causes a reduction in biomass and biodiversity in regularly trawled areas (Kenchington et al., 2001; Tuck et al., 1998). Predation of injured fauna left behind in recently trawled areas exacerbates mortality caused by bottom towed gear use (Groenewold and Fonds, 2000; Kaiser and Spencer, 1994). Further, plumes are generated by bottom towed gear use in sedimentary habitats. Sediment plumes can smother remaining fauna and disrupt important chemical cycling (Mengual et al., 2016; Riemann and Hoffmann, 1991). The magnitude of the effects of bottom towed gear activity on sedimentary habitats varies with the size of the gear, the sediment type and level of natural disturbance (Lambert et al., 2014).

Hiddink et al., 2006 demonstrated that the initial impact of a trawling event was the largest, with subsequent events causing incrementally smaller effects on the physical structure and biological community. This suggests that even extremely low levels of trawling activity can be significantly damaging.

5.3.1 High/moderate energy circalittoral reef

Rocky reef is vulnerable to damage from bottom towed fishing gear, being a complex, hard substrate environment as explained above. Due to risk of damage to gear by hard, rugose structures, and the grounds not being suitable to produce high numbers of target species, rocky reef is often avoided by bottom towed gear users (Boulcott and Howell, 2011). However, unintentional overlap or spillover effects may occur when reefs are in close proximity to preferred grounds (Boulcott and Howell, 2011). Evidence suggests that bottom towed gear kills, physically damages and removes attached epifauna from hard substrate (Boulcott and Howell, 2011; Jones, 1992). Additionally, boulders up to $1m^2$ are able to be lifted, turned and dragged along the seabed by gear (Boulcott and Howell, 2011), increasing physical destruction. Use of bottom towed gear in adjacent sedimentary habitats can cause temporary re-suspension of sediments, which may result in smothering of sessile epifauna associated with rocky reef (Boulcott and Howell, 2011).

5.3.2 Blue mussel (M. edulis) beds

Physical impacts of bottom towed gear on blue mussel beds have the potential to be severe, however, due to the ability of the habitat to recover quickly, the overall sensitivity of the feature is deemed to be medium (Tillin et al., 2014). Bottom towed fishing activities can affect the health of blue mussel beds directly by removing, damaging, or killing individuals through abrasive action (Denny, 1987; Tyler-Walters, 2008). Direct abrasion not only removes part of the bed but attracts mobile scavengers and predators that then increase predation pressure on surviving mussels (Bergmann et al., 2002). Mussel dredging is particularly destructive, as it removes substratum, mussels, and associated flora and fauna. Recovery rates from abrasive disturbance rely on recruitment levels, which are known to be highly unpredictable (Tillin et al., 2014). Bottom towed fishing activities may also affect the health of blue mussel beds indirectly through re-suspension of sediments resulting in smothering (Riemann and Hoffmann, 1991). Blue mussels are able to clean their shells and decrease the size of their gills in re-suspension events meaning that they are highly tolerant to smothering (Essink, 1999; Moore, 1977; Theisen, 1982). Despite these abilities preventing immediate declines, energetic costs may result in reduced fitness over time (Tillin et al., 2014).

5.3.3 Ross worm (S. spinulosa) reefs

Ross worm reef is exposed to physical damage as it is fragile and stands erect from the seabed (Gibb et al., 2014). Physical abrasion can damage or remove worms and their tubes, impacting the extent, function, and health of the reef (Gibb et al., 2014). Due to the structure of the reef forming the basis of the ecological value of Ross worm reef, this is highly detrimental to the ecosystem services provided by the habitat. There is limited evidence of the interaction between bottom towed fishing gear and Ross worm reef. Exclusion of reef habitat from areas where high intensity trawling occurs has been recorded (van der Reijden et al., 2019). Valleys between sandbanks were colonised by reef, but the crests of the sandbanks themselves only contained crust (van der Reijden et al., 2019). This suggests that in the absence of intense physical disturbance, crust has the potential to develop into reef (van der Reijden et al., 2019). There is also evidence suggesting that damage to Ross worm reef by trawling gear is limited, and that repair of damaged tubes by adult worms can occur over several days (Vorberg 2000). However, this study considered an alternative species of tube building worm (*S. alveolata*) that is considered to be less fragile than ross worm reef (Gibb et al., 2014). Further, Ross worm reef is considered to be resilient to increases in suspended sediments and subsequent smothering (Gibb et al., 2014), this however does not include an assessment of the sensitivities of associated fauna to this pressure. Ross worm reef on sediments are considered to be more sensitive to bottom towed fishing gear than that on bedrock (Gibb et al., 2014).

5.3.4 Tentacled lagoon worm (A. rominji)

There is a significant lack of data regarding the life history of tentacled lagoon worm, and thus its sensitivity to disturbance is largely unknown (Tyler-Walters and White, 2017). Due to its small size, low dispersal potential, and lack of planktonic larval stage, it is likely that the species forms discreet populations and is vulnerable to local impacts (Chaouti and Bayed, 2006; Tyler-Walters and White, 2017). Therefore, mortality of individuals associated with bottom towed fishing gear use may cause significant effects on a discrete population that may not be recoverable.

6. Description of Options Considered

A range of management options were developed and considered by KEIFCA. Due to unique peculiarities being identified at each MCZ, a limited number of appropriate management options were available for consideration. This resulted in limited opportunities for stakeholder engagement in developing options, however, where possible, pre-consultation for the preferred option occurred.

6.1 Option 0: Do nothing.

This option would consist of not introducing any permanent management measure in any of the three designated MCZs. This would leave all three sites and their respective designated features vulnerable to damaging activities that may hinder the COs of each site. Therefore, KEIFCA would not be upholding its statutory duties to further (or least hinder) the COs of MCZs within its District as stated in MaCAA. This option is not considered further.

6.2 Option 1: Voluntary agreement for fishermen to not use bottom towed fishing gear within the Dover to Deal MCZ, Swanscombe MCZ, and the inshore portion of the Goodwin Sands MCZ.

This option would consist of working with local fishermen, allowing them to take on responsibility and stewardship for all three sites. This would involve facilitating an understanding of the value of each site to the ecology and industry of the region, which would lead to fishermen working with the IFCA to agree to avoid damaging the protected features of the site. KEIFCA believes that due to the risk of non-compliance, voluntary measures are not appropriate in this case. This option is not considered further.

6.3 Option 2: Update the KEIFCA 'Bottom Towed Gear (Prohibited Areas) Byelaw 2017' to include the Dover to Deal MCZ, Goodwin Sands (inshore) MCZ, and Swanscombe MCZ and surrounds.

Updating this byelaw would prohibit the use of bottom towed fishing gear within the Dover to Deal MCZ (Figure 7), Goodwin Sands (inshore) MCZ (Figure 11), and Swanscombe MCZ and surrounds (Figure 12), and thus protect designated features from potential damage. This management seeks to further COs of all three sites and ensures that the KEIFCA is upholding their legal duty. Whole-site protection promotes site integrity, protecting areas that extend beyond designated features and maintaining ecological processes and functions that support the health of vulnerable habitats and species (Rees et al., 2013). Further, straight-forward demarcation increases compliance and ease of enforcement. This is the recommended option for the management of the Dover to Deal, Swanscombe and Goodwin Sands MCZs.

6.3.1 Dover to Deal MCZ

The Dover to Deal MCZ contains four features with a RECOVER objective (Annex I). All four features are sensitive to bottom towed fishing gear use. Although extremely low levels of bottom towed fishing activity occur at the site, the first pass of a trawl often causes the most damage (Hiddink et al., 2006), and therefore, any level of bottom towed fishing gear use is not compatible with RECOVER COs at the Dover to Deal MCZ. In order to uphold its legal duty, KEIFCA are required to prohibit bottom towed fishing gear over features with a RECOVER objective. RECOVER features comprise a large proportion of the site, and when buffer zones are added, it becomes clear that a whole site closure is the most appropriate management for the site. This allows for clear demarcation of spatial management, which promotes compliance and enhances the practicality of enforcement. Further, whole-site protection maintains site integrity by protecting broad-scale processes that may be associated with the health of RECOVER features. To uphold KEIFCA's legal obligations, maintain site integrity, promote compliance, and ensure practicality of enforcement, whole site protection is required.

Pre-consultation was conducted for the proposed management. Officers visited local ports to discuss the proposal with fishermen and organisations known to use the area. Flyers were handed out in Deal, Dover, Folkestone, and Ramsgate ports, detailing the management. No concerns were raised, with many fishermen only concerned with static gear management in the area.

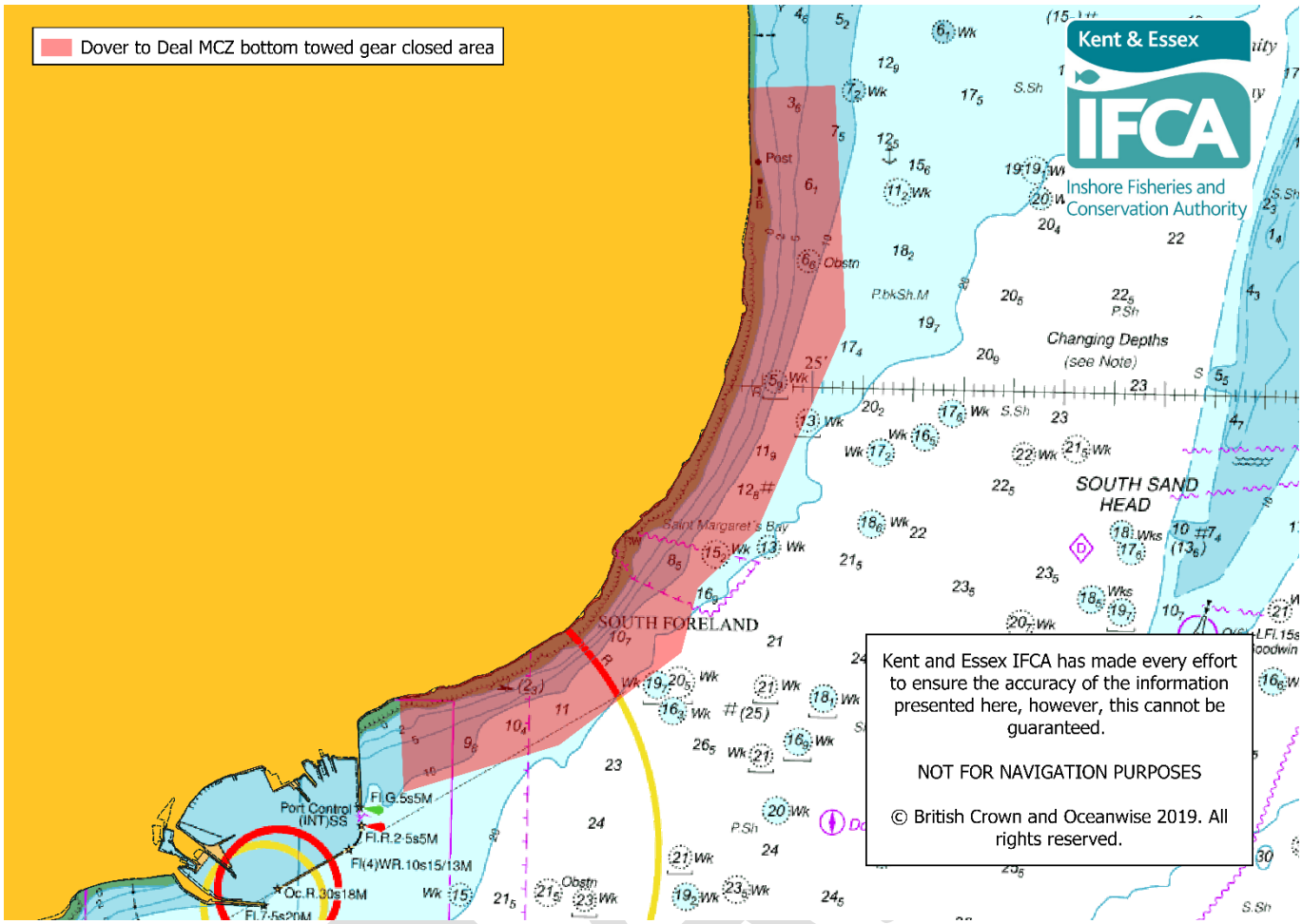

Figure 7: Dover to Deal MCZ proposed bottom towed gear closed area.

6.3.2 Goodwin Sands (inshore) MCZ

The Goodwin Sands MCZ contains three features with a RECOVER objective (Annex II). Although extremely low levels of bottom towed fishing activity occur at the inshore portion of the site, the first pass of a trawl often causes the most damage (Hiddink et al., 2006), and therefore, any level of bottom towed fishing gear use is not compatible with RECOVER COs at the Goodwin Sands MCZ.

Due to the ecological value of the habitat, and the complexity associated with managing an ephemeral feature, Ross worm reef became the management focus of this site. KEIFCA and NE undertook two years of surveys, consisting of sidescan sonar transects, Adaptive Resolution Imagery Sonar (ARIS) camera drops, and grab sampling (Figure 8). From these surveys, KEIFCA was able to map the spatial footprint of Ross worm reef throughout the Goodwin Sands MCZ (Figure 9). This allowed the identification of large and healthy reefs throughout the inshore portion of the site. There is evidence of reef being present for over a decade, suggesting that although movement is expected, an ecologically valuable reef has persisted within the inshore portion of the Goodwin Sands MCZ.

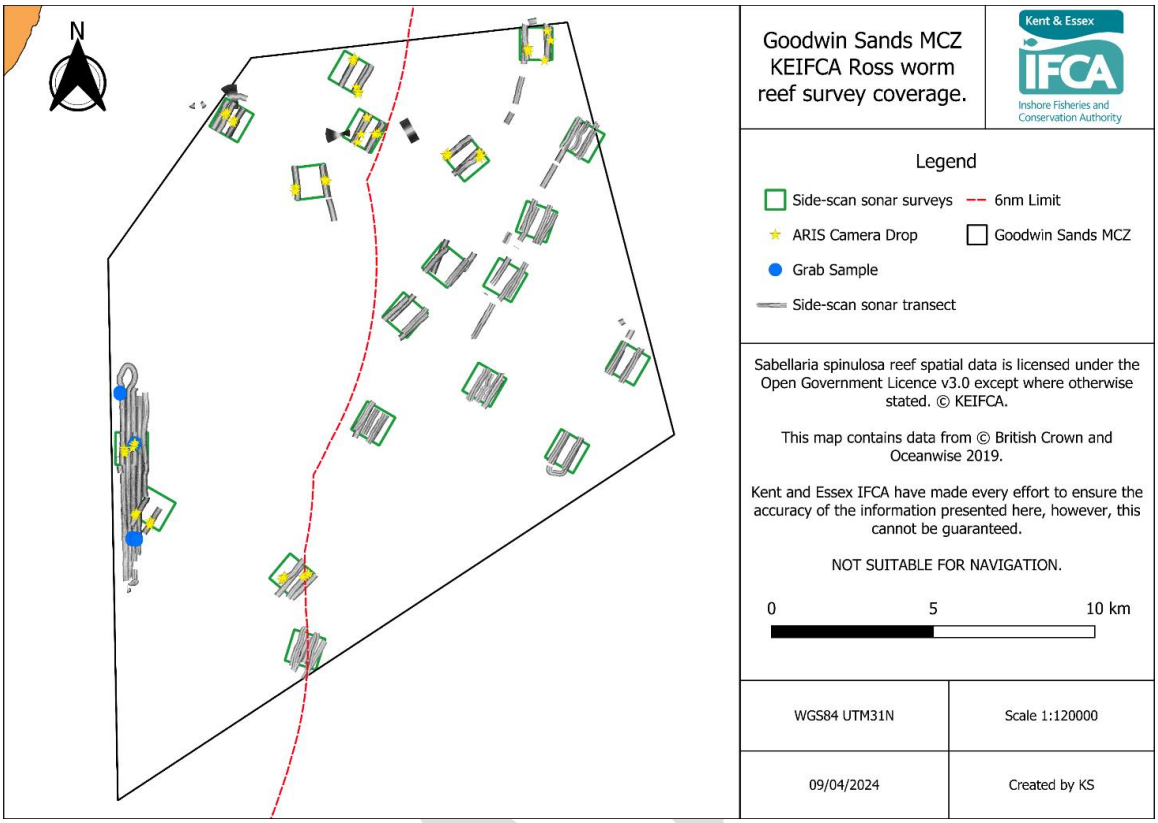

Figure 8: Ross worm reef survey coverage.

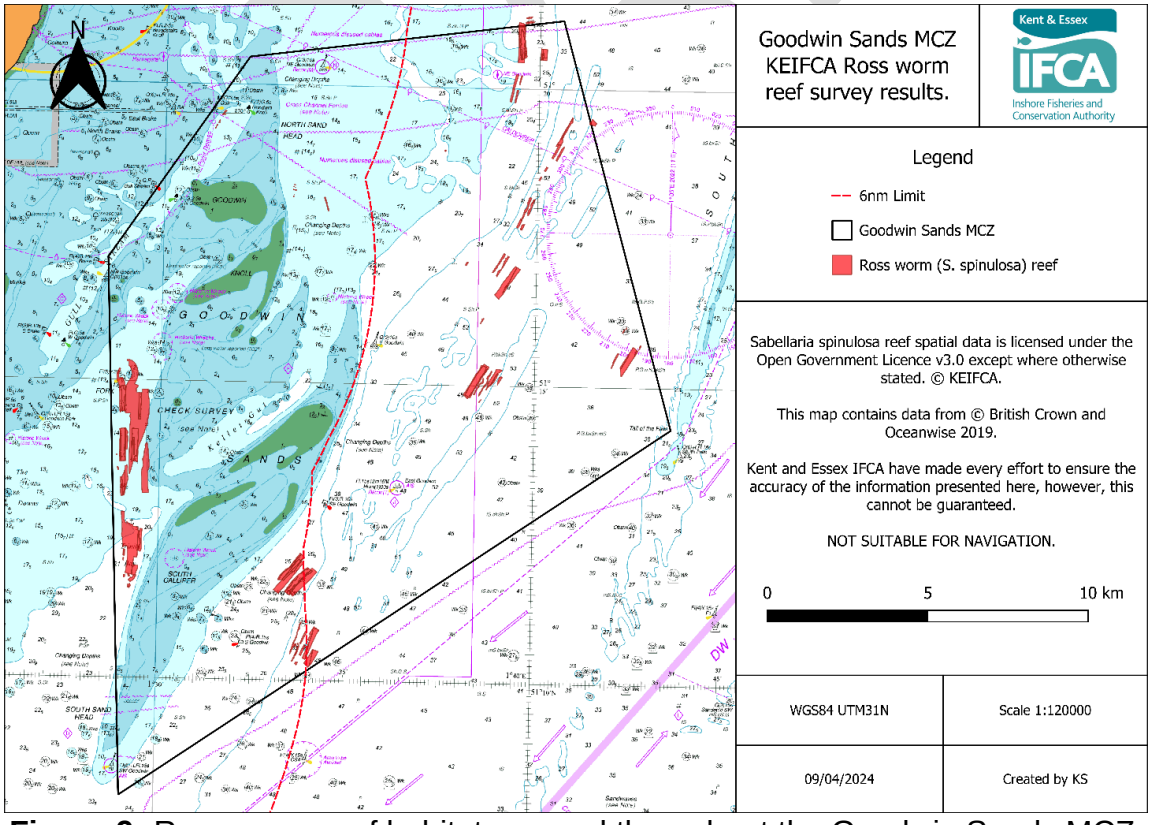

Figure 9: Ross worm reef habitat mapped throughout the Goodwin Sands MCZ.

To achieve long-term spatial management, potential movement of designated features is required. Through understanding both the annual cycle of growth and degradation, along with the complex interplay of natural and anthropogenic factors that influence the spatial extent and health of Ross worm reef, it became clear that the movement of Ross worm reef is underpinned by variation in supporting habitats and processes. Coarse sediment is essential for the initial settlement of Ross worm individuals and facilitates the formation of areas of crust. Subtidal sand is essential as tube-building material, and thus, the transport of subtidal sand is also a crucial influence on where Ross worm reef can form. Finally, crust facilitates the thriving of Ross worm reef. It is both a footprint for potential reef, and a source of larval supply, which is essential due to the reliance of reef growth and maintenance on juvenile recruitment.

The inshore portion of the Goodwin Sands MCZ is known to be highly energetic, with tidal currents and storms pushing and pulling significant volumes of sediment on both a short- and long- timescale (Cloet, 1954; Dix et al., 2008). Storms or significant currents move the sediment over a period of days, sometimes bringing previously undiscovered shipwrecks to the surface (Treanor, 1892; Wessex Archaeology, 2006). Large-scale movement of the banks themselves occur over a period of years, driven by persistent tides and currents (Wessex Archaeology, 2006). Further, the sediment source/sink relationship between the Goodwin Sands and other sandbanks in the region (e.g. Margate Sands) is variable (Wallingford et al., 2002). The movement of these sandbanks underpin a highly mobile and dynamic ecosystem, as processes governing biology move and change over both short- and long-term timescales. This is an especially significant influence on the natural variability of Ross worm reef, as all supporting habitats and processes are directly linked to hydrodynamics and sediment movement at the site.

Ross worm reef is a habitat with high levels of natural variability, which is exacerbated in the Goodwin Sands MCZ due to the mobile nature of the site. This results in a high level of movement of reef features over time. Thus, to ensure long-term management of the site, cater for potential movement of the feature, and to protect the dynamic, broad-scale processes upon which Ross worm reef relies, whole-site protection is required.

Whole site closure to bottom towed fishing gear also protects a high density of wrecks that are present at the site (Figure 10). These wrecks are not only historically valuable to the UK but tied closely to coastal Kent towns and their communities. Further, whole-site closure provides an important research opportunity to understand the natural variability of Ross worm reef, and therefore improve our management of the feature.

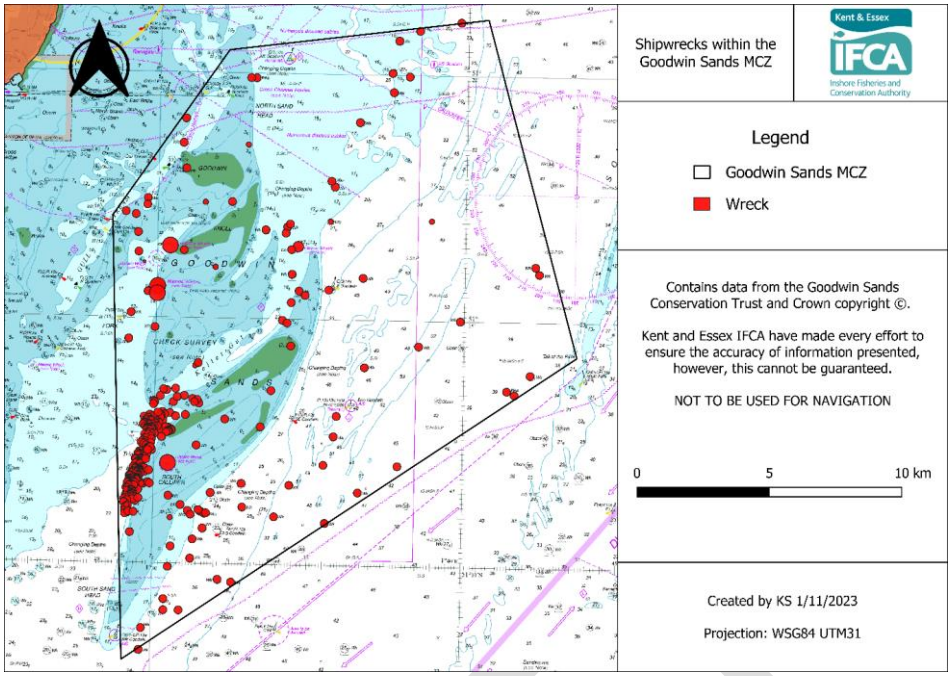

Figure 10: Known wrecks within the Goodwin Sands MCZ. Data from the Goodwin Sands Conservation Trust, provided in 2023.

This management has been developed with significant levels of stakeholder engagement. Local Non-Governmental Organisations and Ramsgate fishermen have provided information that has been integrated into KEIFCA's understanding of the value of the site to a range of users. A meeting was held with Ramsgate fishermen, the Thanet Fishermen's Association, the Goodwin Sands Conservation Trust, NE, and the MMO, to discuss the closure of the entire site to bottom towed fishing gear. No parties expressed concern, with all seeing the need for broad-scale management of this dynamic site.

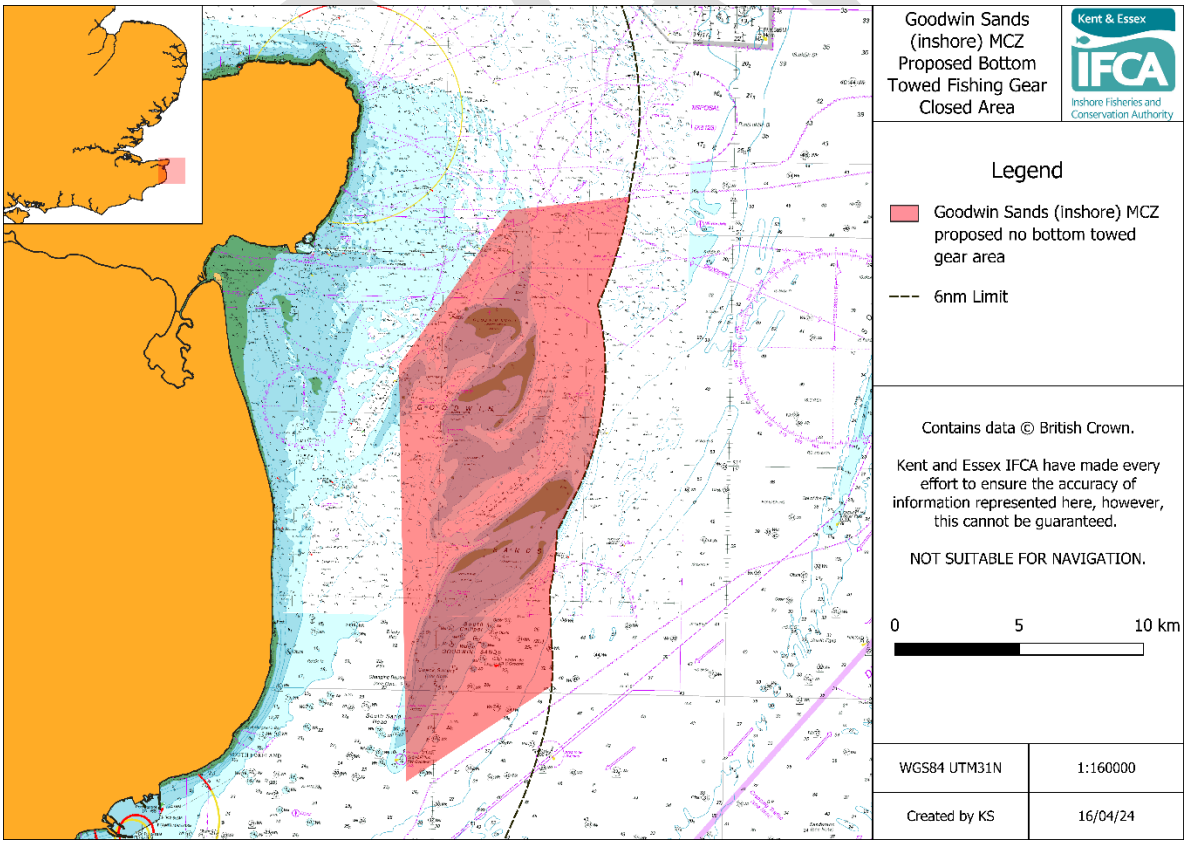

Figure 11: Goodwin Sands (inshore) MCZ proposed bottom towed fishing gear closed area.

6.3.3 Swanscombe MCZ and surrounds

Tentacled lagoon worm is thought to be significantly affected by localised disturbance. Due to the small size of the Swanscombe MCZ, disturbance from bottom towed gear at any location within the site is likely to impact the tentacled lagoon worm population. The species is rare and data deficient. Pathways for recovery, and their ability to resist physical damage are largely unknown, therefore precaution is required. To protect the feature from potential and future damage, bottom towed fishing activity must be prohibited from the entirety of the site.

The site is already protected from trawling by an inherited EA byelaw that extends both upstream and downstream from the Swanscombe MCZ (Figure 5). Enforcing a bottom towed gear area between two no-trawling areas would be impractical. Instead, combining management into a singular no bottom towed fishing gear area allows ease of enforcement and promotes compliance. This would also amalgamate byelaws relating to bottom towed fishing gear into one place, simplifying compliance and enforcement further. KEIFCA believe that the implementation of a no bottom towed byelaw will offer an added level of protection to the tentacled lagoon worm, preventing the possibility of future fishing gear interactions, and satisfying the COs of the designated features to be maintained in a favourable condition.

There is a clear lack of stakeholders to engage with when developing management for this site, due to the absence of commercial fishing activity. Thus, no pre-consultation has been conducted. Consultation for the proposed management of this site will occur during the formal statutory consultation period instead.

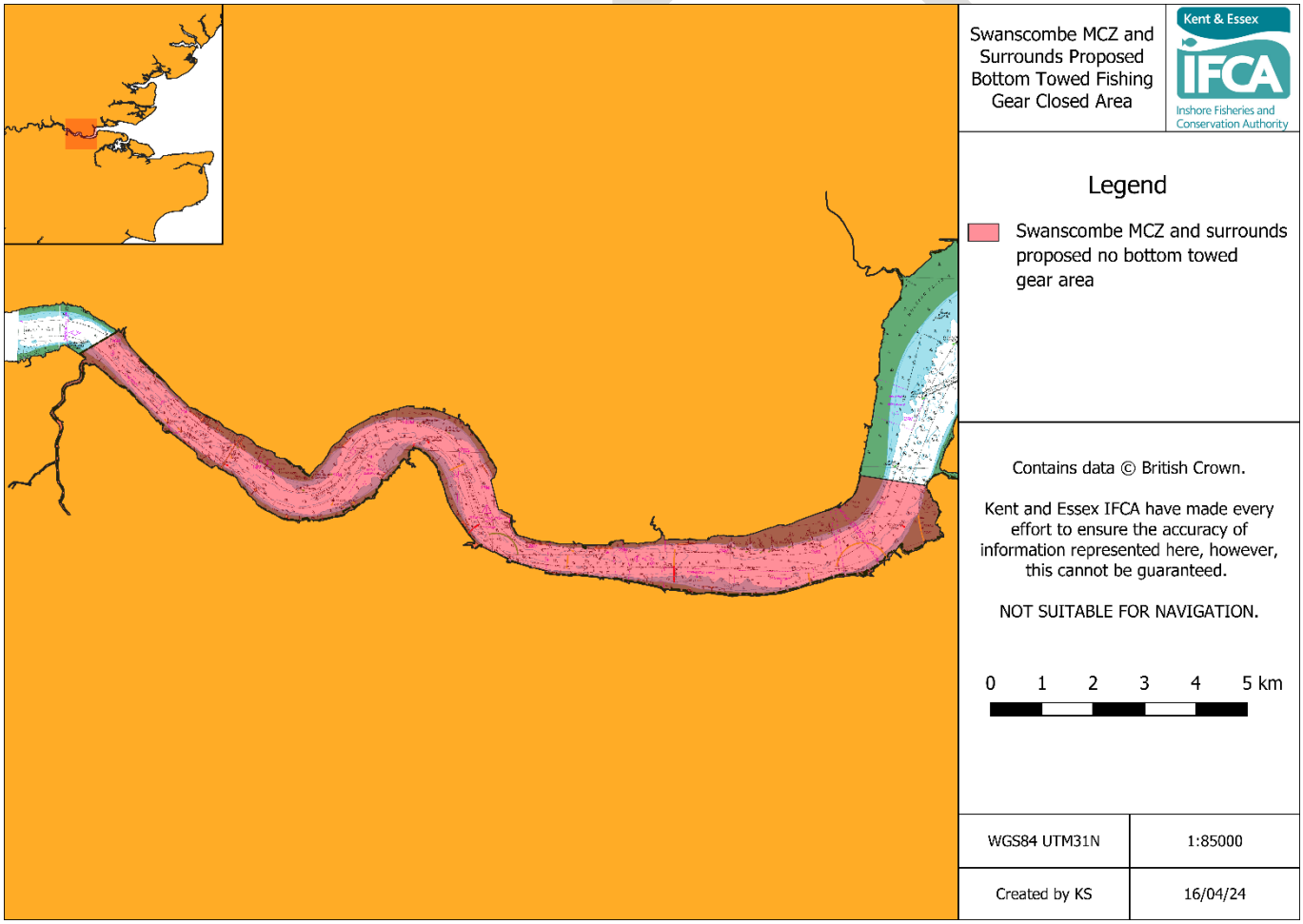

Figure 12: Swanscombe MCZ and surrounds proposed bottom towed gear closed area.

7. Analysis of costs and benefits (Option 2)

All following costs and benefits are for the introduction of bottom towed gear prohibited areas for the Dover to Deal MCZ, Goodwin Sands (inshore) MCZ, and Swanscombe MCZ and surrounds.

Information available to inform an assessment of the impacts of the proposed closure has been taken from:

- Details of licensed fishing vessels in the area (MMO list of registered vessels combined with KEIFCA officer's local knowledge)
- Landings data for vessels from 2021 to 2023 taken from entered logbook and sales note data provided by the MMO (MMO landings data goes only to ICES area rectangles and not to specific locations of catch).
- Information gathered from fishers and industry representatives directly by KEIFCA.

7.1 Limitations of analysis

The implementation of this byelaw has the potential to impose costs and benefits for both the fishing industry and KEIFCA as regulators, however there are limitations in estimating impacts accurately.

Estimations of monetary costs have been attempted, however variables such as individual income are difficult to quantify and highly variable, and therefore have a high level of uncertainty. Although calculations have been made to estimate the closest possible value of loss to those vessels that would be affected by the byelaw, these are based on ICES Rectangle landings data from the MMO. This data is broad-scale and doesn't have the resolution required to capture the high spatial variability of fishing effort across the KEIFCA District. Anecdotal evidence from fishermen, and expert officer knowledge has been used in this assessment to ensure that fine-scale variability is considered. Much of this analysis is also non-monetised, as attributing value to factors such as ecosystem services is extremely complex and therefore beyond the scope of this analysis.

7.2 Costs for recommended option

The exclusion of bottom towed gear from the proposed areas would result in the following costs:

- Direct cost to the industry from reduced fishing grounds
- Costs associated with displacement to other fishing grounds
- Potential impacts on other areas due to displacement

Direct costs to the fishing industry can be monetised and these estimated values have been collated and presented as part of the impact assessment. Environmental costs due to increased damage of habitats are difficult to value and are therefore described here as non-monetised costs.

7.2.1 Fisheries

There is limited fishing activity in all three proposed management areas, and there have been no KEIFCA sightings of bottom towed fishing gear use within any of the three sites in the past five years (Figure 13). However, due to the sensitivity of designated features to bottom towed fishing gear, and the damage caused by even extremely low levels of activity, a ban is necessary to protect against potential future or undetected current activity.

At the Goodwin Sands (inshore) MCZ, low levels of potting and netting currently occur, with preferred grounds located further inshore. The Goodwin Sands and the shipwrecks contained within the series of sandbanks provide a level of natural protection against bottom towed gear at the site, with risk of damaged or lost gear high. Historically, KEIFCA has recorded instances of trawling and mussel dredging occurring at the site, but none in the past five years.

At the Dover to Deal MCZ, the primary fishing activity is crab and lobster potting. Overall fishing activity at the site is low, with preferred grounds being located further north along the coast. Due to variable ground, bottom towed gear is not commonly used at the site. Historically, KEIFCA has recorded instances of mussel dredging occurring at the site, but none in the past five years.

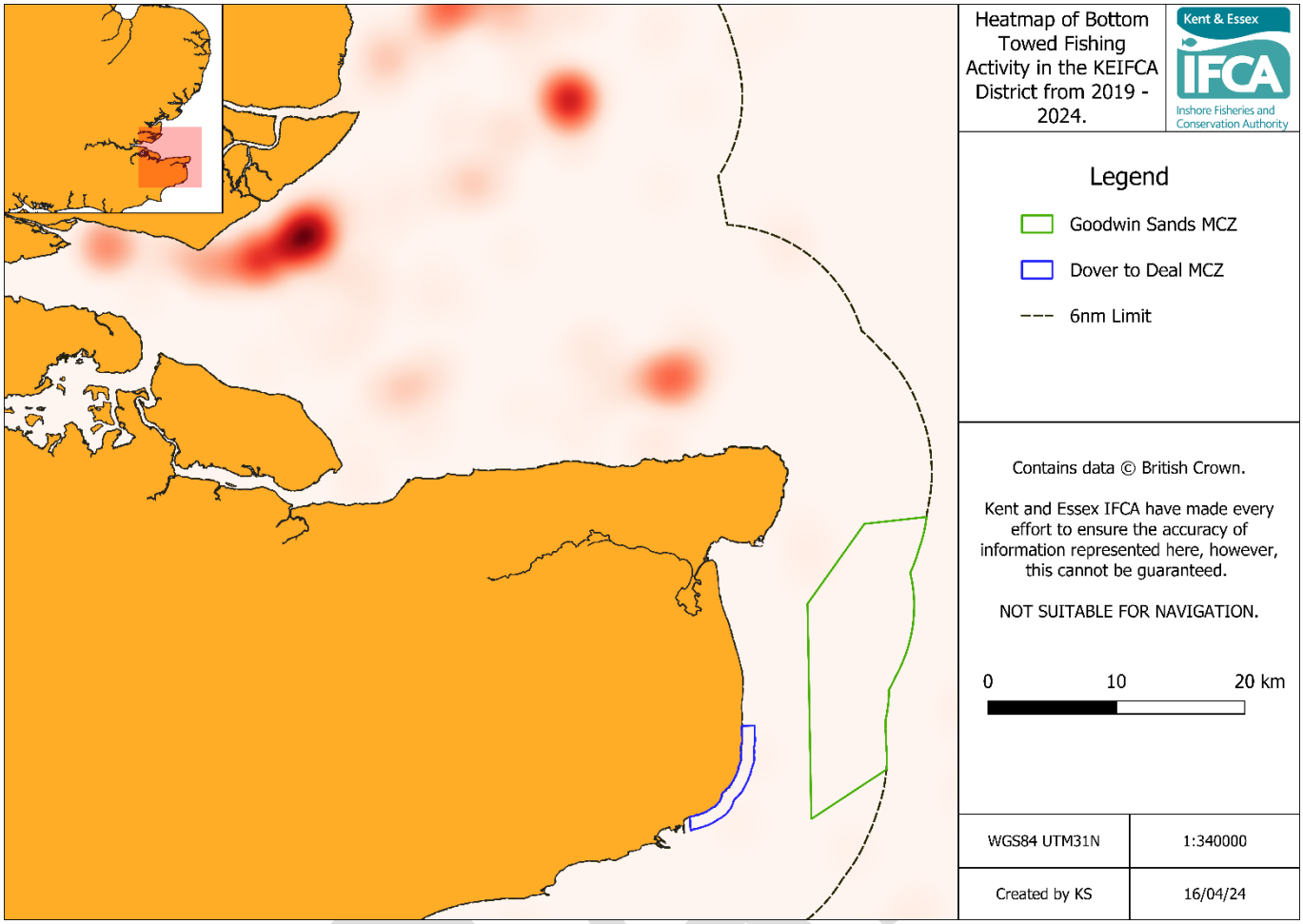

Figure 13: The hotspots of bottom towed fishing activity in the KEIFCA district compared to the boundaries of the Dover to Deal MCZ and the inshore portion of the Goodwin Sands MCZ, using KEIFCA patrol data from 2019 to 2024.

At the Swanscombe MCZ and surrounds, there is no evidence of commercial fishing activity, however low levels of recreational, shore-based angling have been reported at the site. The area is a major shipping and navigational channel serving the London ports which limits fishing activities along with the current no-trawl byelaw.

A potential reduction in catch from bottom towed fishing gear in the proposed closed areas could cause a decrease in landings. In order to estimate potential financial impacts on the inshore fishing fleet, landings data supplied by the MMO were analysed. Goodwin Sands (inshore) MCZ and Dover to Deal MCZ lie within the ICES Rectangle 31F1, and the Swanscombe MCZ and surrounds lies within the ICES Rectangle 31F0 (Figure 14). Annual landings data for these two Rectangles over the last three years is displayed in Table 1 and Table 2. The landings are only including UK vessels, as non-UK vessels are prohibited from fishing within 6nm, so these landings cannot be attributed to any of the areas considered for management in this IA.

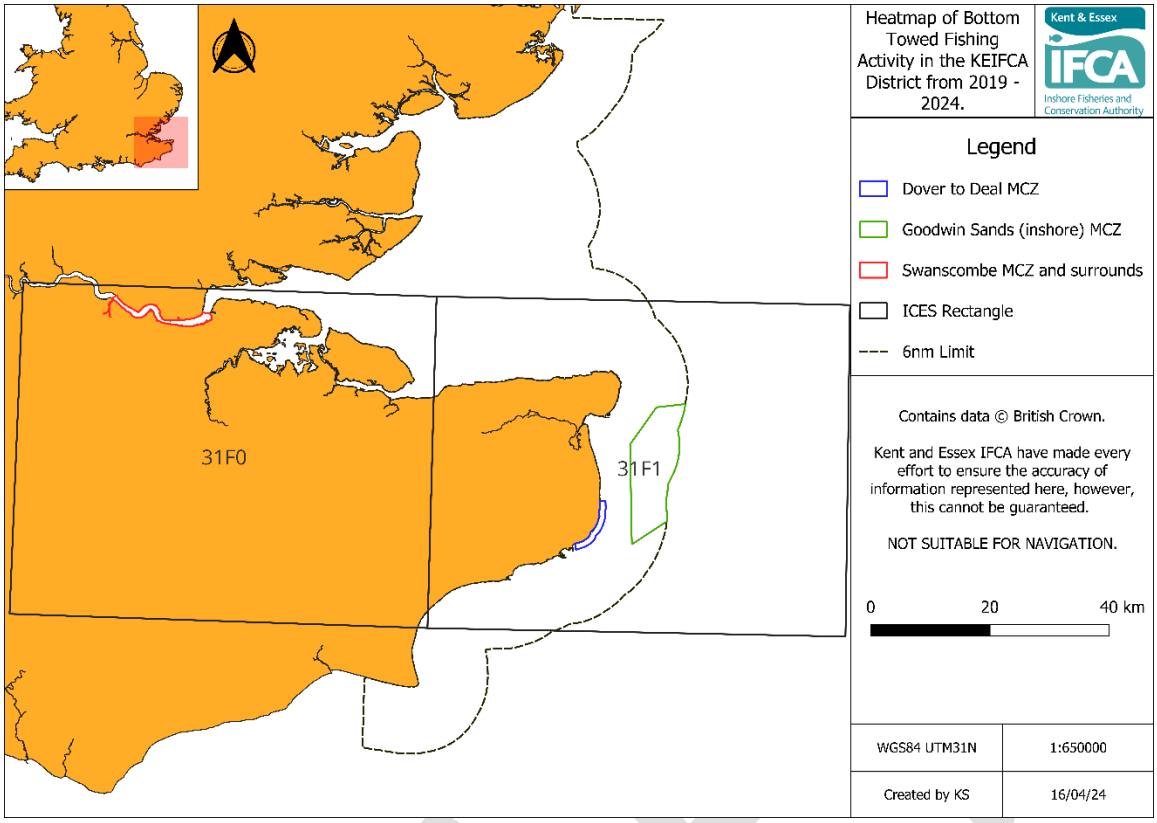

Figure 14: ICES Rectangles and each proposed management area. Goodwin Sands (inshore) MCZ and Dover to Deal MCZ lie within 31F1, and Swanscombe MCZ and surrounds lies within 31F0.

Table 1: Landings values (live weight in tonnes) for ICES rectangles that overlap with Dover to Deal MCZ, Goodwin Sands (inshore) MCZ, and Swanscombe MCZ and surrounds.

Year	Live weight of landings per ICES Rectangle (t)	
	31F0	**31F1**
2021	87	2,017
2022	715	2,314
2023	660	2,064
Average	**487.3**	**2,131.7**

Table 2: Value of landings (£) for ICES rectangles that overlap with Dover to Deal MCZ, Goodwin Sands (inshore) MCZ, and Swanscombe MCZ and surrounds.

Year	Value of landings per ICES Rectangle (£)	
	31F0	**31F1**
2021	52,831	2,394,322
2022	783,655	3,225,218
2023	807,446	3,907,968
Average	**547,977.3**	**3,175,836**

A calculation has been made into the maximum value potentially lost to those vessels excluded from the fishery, based on the area of each MCZ byelaw area as a percentage of the area of its respective ICES rectangle (Table 3). The proposed closed areas are approximately 5% of the sea area of 31F1 (Dover to Deal MCZ 0.3%; Goodwin Sands (inshore) MCZ 4.7%) and 5.5% of the sea area of 31F0. Therefore, an equivalent percentage of landing value will be attributed to each area.

Table 3: Maximum value of lost landings per year if management areas come into force in each of the proposed management areas.

Proposed management area	Maximum lost (£)
Dover to Deal MCZ	9,527.51
Goodwin Sands (inshore) MCZ	149,264.29
Swanscombe MCZ and surrounds	30,138.75

As an average over 3 years, this provides only a snapshot of a fishery which may be highly variable over different years. It is also important to note that this figure is only a percentage of overall landings based on area size of each management area. It is likely that the value would be significantly less than this figure due to spatial variability in fishing effort and the relatively light intensity of fishing (particular bottom towed fishing) in all three proposed management areas.

As the number of vessels which have been observed using bottom towed fishing gear within each area is low, it is expected that the impact on the fishing fleet from this closure will be limited. As ICES rectangle covers such a large area containing other key fishing grounds, it is not possible to accurately identify the value of the proposed closed area from landings declarations.

In order to assess the likely effects of the proposed closure on fishing activities, the extent to which vessels would be able to maintain the value of the catch by moving effort to other areas needs to be assessed. This proposed option will only limit the use bottom towed fishing gear over the sites and not the use of fixed/drift nets and pots. Due to low levels of bottom towed fishing pressure in each area, fishers should not need to change fishing habits significantly. As a result, the potential for displacement will be minimal.

For the recommended option, there may be potential increased costs in terms of fuel and operating costs for vessels travelling further afield to access alternative fishing grounds and to compensate for potential loss of catch due to the proposed closed area. These costs are difficult to predict and quantify but as bottom towed gear usage within each site is rare, it is not likely that the impact on fishermen from displacement will be significant.

7.2.2 Administrative and enforcement

The lead responsibility of enforcing an IFCA byelaw under Section 155 of the Marine and Coastal Access Act 2009 will fall to KEIFCA. All of the proposed closed areas lie within 6nm. The existing routine patrols undertaken by the IFCA will be the method of enforcement as all fishing vessels in the area are under 12m and therefore do not have VMS. It will soon be a legal requirement for vessels under 12 metres to transmit data to the MMO from an I-VMS device. This will become an important factor in site enforcement.

7.3 Benefits of recommended option

The exclusion of bottom towed gear from these areas would prevent the use of bottom towed gear over the features and result in environmental benefits of maintaining or recovering habitats. This then has flow-on impacts to fisheries, along with other benefits. It is not possible to quantify and monetise these benefits and therefore they are described here as non-monetised benefits.

Closing the three areas to bottom towed fishing affords appropriate protection and safeguarding of the ecological characteristics that hold environmental value. The ecosystem services and ecological value detailed in Section 4.3 including increased biodiversity, may be maintained and enhanced as a result of protection from bottom towed fishing gear. This will contribute to meeting the COs of all three MCZs.

Environmental benefits from the protection of these three sites from bottom towed fishing activity may flow on to improved commercial fish stocks within each site and in surrounding areas. Increasing nursery area extent and quality may increase survival of commercially important species, and increased food and habitat availability may increase biomass. Further, the absence of bottom towed fishing activity may result in a reduction of static gear lost and damaged, accruing financial benefit to fishermen that use static fishing gear within each site.

7.4 Summary of costs and benefits

The prohibition of bottom towed fishing gears within the Dover to Deal MCZ, the Goodwin Sands (inshore) MCZ, and the Swanscombe MCZ and surrounds will incur a range of costs and benefits. Costs include those to fishermen, in the form of reduction in fishing grounds and displacement to other areas. Due to the low level of bottom towed fishing intensity across all three of the sites, and responses to considerable stakeholder engagement, KEIFCA are confident that the costs associated with the proposed management are limited. The benefits of the proposed management are enhanced quality of valuable habitat, and a resultant increase in biodiversity, which may have flow-on effects to commercial fish stocks within each site and surrounding areas.

8. Small firms impact test and competition assessment

This byelaw reduces fishing grounds available to fishermen that use bottom towed fishing gear. Fishermen that use static gear will not have fishing grounds available reduced and will potentially benefit from the absence of bottom towed fishing activity in closed areas due to reduced loss of and damage to gear. This may result in a change in competition, however, low levels of bottom towed fishing gear activity in all areas proposed for management means that this change will be insignificant.

9. Risks and assumptions

Average cost estimates for the fishing industry are based on MMO landings values, which are reported over the whole of ICES rectangles 31F1 and 31F0. It is unknown what proportion of the total landings value was actually derived directly from the proposed prohibited areas. Information gathered from fishers and other stakeholders during the pre-consultation period is used to support the evidence base and assumptions with the caveat that it is anecdotal evidence only. Finally, a key assumption of intervention is that it will be successful in preventing further damage to the protected features, and that the CO of the MCZ will be furthered.

10. Conclusion

Recommended option: Update the KEIFCA 'Bottom Towed Gear (Prohibited Areas) Byelaw 2017' to include the Dover to Deal MCZ, Goodwin Sands (inshore) MCZ, and Swanscombe MCZ and surrounds (**Option 2**).

KEIFCA is the most appropriate authority to take forward fisheries management measures between 0 and 6 nm. The bottom towed gear prohibited areas cover the entirety of the Dover to Deal MCZ, the Swanscombe MCZ, and the inshore portion of the Goodwin Sands MCZ. This byelaw manages the risk of bottom towed fishing activity causing damage to designated features. Implementing this management ensures that KEIFCA are upholding their legal duty, seeking to ensure that COs of MCZs are furthered. It is the most practical to enforce, promotes compliance through clear demarcation, maintains site integrity, and furthers COs at each of the three sites.

This option is recommended following extensive consultation with the local fishing community and Non-Governmental Organisations, in the form of meetings, informal interactions, and flyers.

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Annex I

Designated features of Dover to Deal MCZ.

Feature	Conservation Objective
A1.1 High energy intertidal rock	**Maintain** in a favourable condition
A2.1 Intertidal coarse sediment	
A2.2 Intertidal sand and muddy sand	
A1.3 Low energy intertidal rock	
A3.2 Moderate energy infralittoral rock	
A1.2 Moderate energy intertidal rock	
A5.4 Subtidal mixed sediments	
A5.2 Subtidal sand	
Native oyster (*Ostrea edulis*)	
Intertidal underboulder communities	
Littoral chalk communities	
Subtidal chalk	
Blue mussel (*Mytilus edulis*) beds*	**Recover** to a favourable condition
Ross worm (*Sabellaria spinulosa*) reef*	
A4.2 Moderate energy circalittoral rock*	
A4.1 High energy circalittoral rock*	

***** Designated feature newly included in 2019

Annex II

Designated features of Goodwin Sands MCZ.

Feature	Conservation Objective
English Channel outburst flood features	**Maintain** in favourable condition
Subtidal coarse sediment	**Maintain** in favourable condition
Subtidal sand	**Maintain** in favourable condition
Blue mussel (*Mytilus edulis*) beds	**Recover** to a favourable condition
Moderate energy circalittoral rock	**Recover** to a favourable condition
Ross worm (*Sabellaria spinulosa*) reef	**Recover** to a favourable condition

Annex III

Designated features of Swanscombe MCZ.

Feature	Conservation Objective
Intertidal mud	**Maintain** in favourable condition
Tentacled Lagoon Worm (*Alkmaria romijni*)	