Natural England

Cromer Shoal Chalk Beds MCZ Imagery Analysis

Final Report

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Seastar Survey Ltd. Project Number – J/21/553

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1 INTRODUCTION

The Cromer Shoal Chalk Beds Marine Conservation Zone (CSCB MCZ) is located on the North Norfolk Coast and extends from Weybourne to Happisburgh, from 200 m off the coast to a distance of between 5 and 10 km offshore, enclosing an area of 315.64 km^2. The site was designated in 2016 as part of Tranche 2 of the MCZ designation process under the Marine and Coastal Access Act (MCAA) 2009. The site was designated for a total of nine habitat types and one geological feature, including rock, sedimentary and chalk habitats. The site encompasses some of the best examples of subtidal chalk beds in the North Sea, as well as subtidal exposures of clay and peat (Green and Dove, 2015).

Subtidal chalk is a geomorphological feature comprising exposed chalk beds and outcrops. This feature is of significance due to the reef habitat the outcrops provide, and to the associated communities that are attracted by the rocky substrate. Within CSCB MCZ, the elevated chalk substrate provides a habitat for a diverse range of fauna. Many mobile crustaceans settle in the crevices formed by the erosion of the chalk, including European lobster (*Homarus gammarus*) and brown crab (*Cancer pagurus*). Grazing animals are supported by the growth of algae on the shallow chalk beds, including the common limpet (*Patella vulgata*), chitons, and gastropods such as the topshell *Calliostoma zizyphinum* (Cefas, 2016). The conservation objective for the subtidal chalk feature in CSCB MCZ is currently set as ‘maintain in favourable condition.’

As part of ongoing work at CSCB MCZ, Natural England are seeking to gain a more detailed understanding of the ecological reliance on the subtidal chalk feature at this site. Attributes of the subtidal chalk feature at CSCB MCZ relevant to this work comprise;

- Presence and spatial distribution of biological communities;
- Presence and abundance of key structural and influential species;
- Non-native species and pathogens (habitat), and;
- Species composition of component communities.

1.1 Objectives

In summer 2021, Eastern Inshore Fisheries and Conservation Authority (EIFCA) carried out a remotely operated vehicle (ROV) video survey within CSCB MCZ. The primary aims of the EIFCA survey were focused on characterising the geological aspects of the site, i.e., to map the distribution and extent of subtidal chalk features, and to gain a better understanding of impacts caused by the potting fishery within the site. Natural England wished to further utilise the video data to improve knowledge of the epibenthic communities present within the CSCB MCZ.

Seastar Survey Ltd. (‘Seastar’) were contracted by Natural England to analyse the ROV video data and to report on the findings. The objectives of the work were;

- To, as far as possible, identify, enumerate and record all taxa observed using semi-quantitative methods;
- To identify biotopes and map habitat types present to the highest EUNIS classification possible;
- To identify and classify chalk substrate present;

- To describe the anthropogenic influences observed to be impacting or potentially impacting benthic features using a categorisation system based on Tibbitt *et al*. (2020);
- To produce a concise, evidence based technical report detailing the findings of the analyses, and;
- To provide all data to the relevant standards including GIS.

This report provides a description of the methods used to analyse the ROV video footage and associated snapshot images and provides details of the results obtained.

2 METHODOLOGY

2.1 Data collection

Video footage was collected during the survey using a high-definition, low-light colour camera (1080p, 30 frames per second) mounted on a Blue Robotics BlueROV2. The ROV was generally towed above the seabed, however, where conditions permitted, the ROV was flown. The primary aims of the survey were to trial the ROV equipment and to collect seabed imagery and imagery of shanks of pots to understand how the two interact and to identify areas of rugged outcropping chalk. ROV video footage was obtained from a total of 88 tows.

The start of line positions of the ROV video tow locations are shown in Figure 2.1.

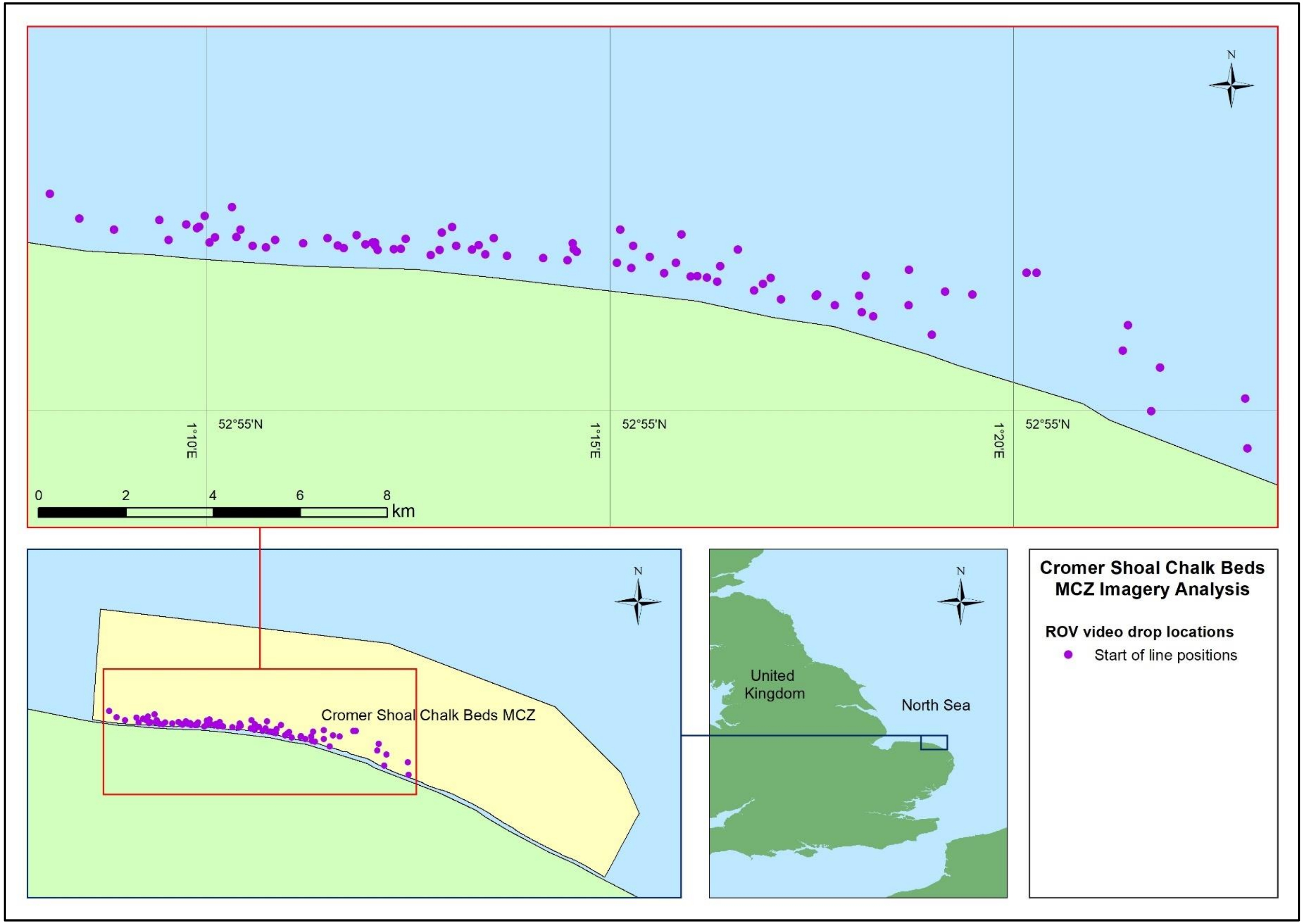


Figure 2.1: Locations of the ROV video tows conducted by EIFCA in CSCB MCZ in summer 2021.

2.2 Video analysis

The video analysis of each camera transect started with an initial assessment to gain a broad understanding of the substrates and biota present. The analysis was carried out using a personal computer and VLC software which allowed slow-motion, freeze-frame and standard play analysis. During the initial assessment, video footage was viewed at 2x - 4x normal speed in order to divide the footage into segments representing different habitat types (including changes in chalk type; see section 2.2.4) and/or biological communities. New video sections were also started where significant changes in video quality occurred, such as periods of zero seabed visibility. As the navigation data were recorded at an average interval of approximately 20 seconds (see section 2.4), it was decided that segments were required to be a minimum duration of 20 seconds. Habitat changes lasting less than this duration were treated as incidental patches and were not recorded as separate segments. Segment transition times were recorded using the playback time.

Each segment was assigned a video quality assessment category as per Turner *et al*. (2016). Segments with zero visibility, or segments showing deployment/recovery, were not analysed further.

A more detailed assessment of the video segments was then performed. A description of the abiotic (i.e. substrate) and biotic (i.e. characterising taxa) features of the observed habitat was recorded. The substrate type was identified and a broadscale habitat (BSH) type was assigned to each video segment.

Species abundance data were recorded in analysis spreadsheets to the best practical taxonomic level using the semi-quantitative SACFOR scale. Approximate counts of large (i.e. > 3-5 cm) 'individual' taxa (e.g. erect sponges, large crustaceans, echinoderms) were made for each video segment and these converted to SACFOR using the length of the video segment as a proxy for area covered. Average SACFOR abundances (for each video segment) of smaller, difficult to count individual taxa (e.g. small anemones) and percentage cover taxa (e.g. seaweeds, hydroids, bryozoans) were estimated using expert judgement. Where taxa could not be readily identified (and for seaweeds and sponges in particular), taxon morphotype, as per the CATAMI morphological classification scheme (Althaus *et al*., 2014), was recorded where possible. A list of the encountered biota was produced for each video segment using species reference numbers as cited in the Marine Conservation Society Species Directory (Howson and Picton, 1997) with additional reference to the World Register of Marine Species (WoRMS Editorial Board, 2022) to avoid problems in species nomenclature.

Due to issues related to underwater visibility/turbidity and to factors related to the ROV deployment (e.g. height above seabed, speed over the ground, lighting), video quality was generally poor. Where quality was determined to be very poor, species abundance data were not recorded. However, biotopes were assigned to each segment based on the visible substrate type and most common taxa, where observed.

2.2.1 Biotope assignment

Video segments were assigned an MNCR biotope according to Connor *et al*. (2004) and following guidance outlined in Turner *et al*. (2016) and Parry (2019), using both the BSH and the species information to assign the most appropriate MNCR biotope. Wherever possible biotopes were assigned at the biotope (level 5) or sub-biotope (level 6) level. However, where video quality was poor, or where biological information was lacking, for example where taxa were observed that cannot ordinarily be identified to species level from video footage alone (e.g. most seaweeds), biotopes were recorded at the biotope complex level (level 4). Where taxa were very sparse (e.g. barren soft sediments with very little epifauna), biotopes were recorded at the habitat complex level (level 3). In cases of extremely poor video quality, only a broad habitat type (level 2) was recorded.

In some cases, it was appropriate to assign more than one biotope to the same video segment, for example, where the seabed comprised a mosaic of more than one substrate type (e.g. patches of cobbles on rippled sand or <20 second alternating bands of chalk bedrock and coarse sediment). The most dominant biotope was assigned as the ‘primary’ biotope and the other assigned as secondary. In addition, if no biotope was found to accurately describe both the biological community and substrate type observed, the MNCR biotope with the ‘best fit’ biological community was assigned but the record flagged as ‘physical mismatch,’ with a level 3 biotope matching the observed substrate also recorded.

It should be noted that some biotope codes/names in this report contain outdated species nomenclature (e.g. biotopes featuring *Saccharina latissima* – formerly known as *Laminaria saccharina* – as a characterising species). While up-to-date biotope names are available via e.g. EUNIS conversion tables, these have not been updated on the Marine Habitat Classification for Britain and Ireland webpages or in Marine Recorder. It was therefore deemed appropriate to use the ‘old’ biotope codes/names in this report in order to maintain consistency with associated data records.

2.2.2 Assignment of features of conservation interest

Following identification of biota and assignment of biotope(s) to each video segment, habitat features of conservation importance (FOCI), as listed in JNCC and Natural England (2010), were identified and assigned. If FOCI component biotopes were found to be present within a video segment the FOCI was assigned. If two component biotopes had been assigned to one video segment (see above), two habitat FOCIs were assigned.

The habitat FOCI ‘subtidal chalk’ was assigned to any video segment containing chalk in any form, whether as bedrock, boulders, cobbles or pebbles, regardless of biotope assigned. The habitat FOCI ‘subtidal sands and gravels’ was assigned to any video segment where sands and gravels (though not cobbles) were a major feature of the substrate present (i.e. were present as more than small patches).

2.2.3 Assignment of Annex I habitats

The presence of any Annex I habitats and associated sub-features, including reef sub-features, was recorded for each video segment. Reef features were determined using criteria outlined in Irving (2009), with a minimum of 10 % hard substrate (i.e. bedrock, boulders or cobbles) required for assignment of Annex I habitat. Due to difficulties inherent in estimating elevation from video footage, assessment of ‘reefiness’ (Table 2.1) was primarily based on seabed composition, i.e., percentage coverage of hard substrate.

Table 2.1: The main characterising features of a stony reef, after Irving (2009).

Characteristic	Not a reef	Resemblance to being a stony reef		
		Low	Medium	High
Composition	< 10 %	10 - 40 %	40 - 95 %	> 95 %
Elevation	Flat seabed	< 64 mm	64 mm - 5 m	> 5 m
Extent	< 25 m^2	> 25 m^2		
Biota	Dominated by infaunal species			> 80 % of species epifauna

2.2.4 *Chalk categories*

For each video segment where hard substrate was observed, the dominant rock type was recorded as either 'chalk', 'other' (i.e. any other rock type than chalk, mainly flint) or 'mixed.' In addition, 'chalk assessment' categories were assigned where 'chalk' or 'mixed' hard substrate was recorded. The chalk assessment categories used were;

- Absent – chalk not observed;
- Pebble/cobble – chalk particles of between 4 – 256 mm diameter;
- Pavement – flat chalk bedrock or veneered chalk;
- Rugged – elevated and complex chalk features and/or chalk boulders.

Generally, the most dominant chalk assessment category in each video segment was assigned, e.g. if the substrate was predominantly composed of pebbles and cobbles but small (< 5 m) patches of chalk pavement were present, the pebble/cobble category was recorded. However, where a mosaic habitat was present, for example in the form of rugged chalk ridges interspersed with flat chalk bedrock, multiple chalk categories were recorded.

2.2.5 *Anthropogenic impacts*

For each video segment, the presence of rope (e.g. pot shanks) and the total number of fishing pots and anchors was recorded. Efforts were made to distinguish between active and lost gear, however, where there was uncertainty, gear was recorded as active. Litter was also recorded using Marine Strategy Framework Directive (MSFD) categories and sub-categories, as listed in Annex 5.1 of JRC (2013).

For each video segment, all observed chalk impacts were recorded. Each chalk impact was assigned a unique identifier, and the counter time at which the impact was observed was recorded. An impact category as per Tibbett *et al*. (2020) was recorded. If there was uncertainty as to which category should be assigned, a broad impact category was recorded instead together with an impact severity rating. For each observed chalk impact, further information was also recorded regarding impact position and extent, impacted chalk relief and feature type, the potential cause of the impact (if present), and the presence of fishing gear. The details of the different categories used in the analysis are provided in Appendix I.

2.3 Still frame analysis

In addition to the analysis of the ROV video footage, analysis was undertaken on a series of still frames (snapshots) captured from the video footage.

In order to ensure that still frames were representative of the habitats observed in the video footage, still frames were captured at intervals of approximately 50 – 70 seconds for each video tow, provided the seabed was visible and seabed features were sufficiently clear to enable analysis to be carried out. The time of each still frame was recorded during the capture process.

Analysis of the still frames focussed on assessment of the substrate present. Observed sediment percentages (generally to the nearest 5 %) were recorded. Where present, the dominant rock type (chalk, other, or mixed, as in the video analysis) was recorded and a chalk assessment category assigned.

Where the image was deemed to be rock-dominated, i.e. where hard substrate (cobble, boulder and bedrock) comprised a minimum of 10 % of the image, MNCR inclination category percentages (to the nearest 5%) were recorded together with a semi-quantitative assessment of MNCR rock features, such as surface relief and siltation, as per MNCR guidance notes for completion of field recording forms (available at https://mhc.jncc.gov.uk/resources/). In addition, the presence of chalk structural complexity descriptors, as per Moffat *et al*. (2019), were recorded for each still frame.

Where the image was determined to be dominated by mobile sediments, a semi-quantitative assessment of surface relief was carried out and the presence of MNCR sediment features, such as ripples and casts, were recorded.

The level of confidence in the assessment of each still frame was recorded, based on the quality of each image. Factors such as low visibility, poor lighting, motion blur and ROV height above seabed all reduced the level of confidence in the assessment of seabed composition and structure. Additional information, including details of quality issues and presence of fishing gear, was recorded as comments.

2.4 Navigation data extraction

The only survey navigation data for the survey were collected using a hand-held Garmin GPS, which was kept on board the survey vessel. The navigation data were extracted by EIFCA and provided to Seastar as excel files.

Trackplot positions were recorded throughout each survey day at non-regular intervals, with recording frequency throughout the survey ranging from 1 sec to 2 min 7 sec, at an average recording frequency of ~20 seconds.

Calculating the start time of each tow in order to extract positional information from the trackplot data proved problematic. Start of line (SOL) and end of line (EOL) waypoints were recorded manually in the GPS for the majority of lines (with a total of 83 SOL waypoints and 74 EOL waypoints recorded), though these were not taken at a consistent point during the deployment/recovery process, e.g. when video recording was started or when the ROV was placed in the water. In addition, prior to each tow deployment, a clapperboard was placed in front of the camera which had, together with tow information, a digital watch displaying the time. Due to quality issues (e.g. condensation inside the camera lens, incorrect placement of the clapperboard) this watch time was only visible on 57 of the 88 tows. In addition, the time was not synchronised with the GPS time, though it was reported to be accurate to within one minute.

As it was visible on the video footage and could be related directly to the video counter time, the clapperboard watch time was preferentially used to determine the SOL time. For the video tows where the clapperboard time was not visible, the SOL waypoint was used, assuming that this was taken when the ROV was placed in the water. For two of the video tows, however, (dives 18 and 79) the SOL waypoint could not be used, either due to the lack of footage of the ROV being placed in the water, or to an obvious inaccuracy in the SOL waypoint time. In these cases, the EOL waypoint time was used, assuming that this was taken when the ROV was removed from the water, and was used, together with the video duration, to calculate the SOL time.

Positional data for each segment were then obtained by relating the video footage counter clock time to the SOL time and this time was related back to the vessel trackplots created from the Garmin data files. For each tow, a record was made of the method used of determine the SOL time and position.

The SOL time for two video tows (dives 21 and 58) could not be calculated as the clapperboard watch time was not visible and no SOL/EOL waypoint was logged. These tows could therefore not be entered into the GIS.

2.4.1 Positional accuracy

The Garmin handheld GPS had a positional accuracy of up to approximately ±5 m, however, as this was kept inside the wheelhouse on the survey vessel, this level of accuracy is unlikely to have been achieved. Furthermore, as the amount of umbilical put out on each deployment was not recorded, layback calculations were not possible. These issues, combined with the inaccuracies encountered when attempting to calculate the SOL time and position, mean that the positional accuracy of the survey is estimated as being at least 50 – 100 m. For the tows where the ROV was flown rather than towed (and where the camera was a greater distance from the survey vessel in an unknown direction), the positional accuracy is likely to be >100 m.

2.5 Habitat mapping

The principal of habitat mapping is based on the acquisition of data which enable areas of consistent reflectivity, areas of consistent depths or bathymetric features to be ground-truthed. The ground-truthing of acoustic data enables a substrate type or biotope to be assigned to areas of consistent sidescan sonar reflectivity or bathymetry.

Data derived from the underwater imagery analysis, including assigned biotopes and chalk assessment categories, were incorporated into the GIS in order to display the distribution of the different habitats observed. However, as no acoustic (e.g. bathymetry, sidescan sonar) data were available for the survey area, habitat maps could not be created.

3 RESULTS

A total of 83 of the 88 videos were analysed. On dives 12 and 48 the seabed was not visible at any point during deployment, while on dive 66 the total seabed time did not exceed the 20 second minimum segment length. Two additional videos (dives 30 and 34) were recorded as being of zero quality throughout the tow and were not analysed further. The remaining videos, representing a total of 12 hours and 55 minutes of seabed time, were split into a total of 289 segments representing different habitats and/or biological communities, with an additional 48 segments recorded as being of zero quality. A total of 11 biotopes (including biotope complexes and habitat complexes) were identified. A summary of the habitats observed is given in Appendix II, and the distribution of assigned MNCR biotopes is shown in Figures 3.1 – 3.4.

A total of 711 still frame images were selected and analysed. Still frames were taken from every video with the exception of the five videos not analysed, at an average of one-minute intervals.

3.1 Observed habitats

The survey area was found to be generally characterised by a mixture of coarse sediments, flat plains of pebbles and cobbles, and chalk bedrock.

Soft sediments in the survey area were dominated by rippled sands. Due to the lack of conspicuous epibiota, these areas were assigned the habitat complex **SS.SSa** (‘Sublittoral sands and muddy sands’). However, where sediments were coarser, or where gravel or pebbles and cobbles were present as more than small patches, the habitat complex **SS.SCS** (‘Sublittoral coarse sediment’) was assigned.

Flat plains of relatively consolidated pebbles and, to a lesser extent, cobbles were frequently observed. These areas were generally characterised by faunal and algal crusts, particularly serpulid worms (likely *Spirobranchus* sp.), encrusting sponges and coralline algae, and were therefore assigned the biotope **SS.SCS.CCS.PomB** (‘*Pomatoceros triqueter* [now *Spirobranchus triqueter*] with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles’). In some cases, red seaweeds were present in abundances of frequent or greater. In these cases, the biotope **SS.SMp.KSwSS.LsacR.CbPb** (‘Red seaweeds and kelps on tide-swept mobile infralittoral cobbles and pebbles’) was assigned.

Where cobbles were more common and/or occasional small boulders were present, a greater diversity of fauna was observed. Commonly identified taxa included silt- and scour- tolerant species such as the sponge *Amphilectus fucorum*, the hydroids *Tubularia indivisa* and *Nemertesia antennina*, the anemones *Urticina felina* and *Metridium dianthus* and the bryozoan *Flustra foliacea*. Where *F. foliacea* was present together with the branching sponge *Haliclona (Haliclona) oculata*, the biotope **CR.HCR.XFa.FluHocu** (‘*Flustra foliacea* and *Haliclona oculata* with a rich faunal turf on tide-swept circalittoral mixed substrata’) was assigned, though *H. oculata* was not recorded in abundances of greater than frequent at any location.

Where bedrock was present, generally as chalk covered with a thin layer of silt, dense (though sometimes patchy) red seaweeds dominated the biological community, with a conspicuous lack of kelp. The biotope **IR.MIR.KR.XFoR** (‘Dense foliose red seaweeds on silty moderately exposed infralittoral rock') was therefore assigned. Epifauna was generally sparse in these areas, though the sponge *A. fucorum* was occasionally recorded in relatively high densities. Where bedrock was less silty, the biota was instead dominated by a mixture of very dense red and brown seaweeds, with occasional low amounts of green macroalgae also present. These areas were assigned the biotope **IR.HIR.KFaR.FoR** ('Foliose red seaweeds on exposed lower infralittoral rock'). While the seaweeds could not be identified to species level, due in part to quality issues, it is likely that, where brown seaweeds were present in higher abundances, the sub-biotope **IR.HIR.KFaR.FoR.Dic** ('Foliose red seaweeds with dense *Dictyota dichotoma* and/or *Dictyopteris membranacea* on exposed lower infralittoral rock') would be appropriate.

On areas of chalk bedrock where epibiota were particularly sparse, or where video quality prevented identification of taxa to even morphotype level, the biotope complex **CR.MCR.SfR** ('Soft rock communities') was assigned. This biotope was also assigned to areas of flat chalk bedrock with sparse epibiota, usually in combination with a sediment biotope due to the presence of a sand or gravel veneer.

The commercial species European lobster (*Homarus gammarus*) and brown crab (*Cancer pagurus*) were recorded throughout the survey area, generally either associated with fishing gear (though individuals inside pots were not included in abundance estimates) or with chalk cobbles and boulders. Brown crab was particularly widespread, being recorded on a total of 45 segments from 33 tows in abundances of up to common.

3.1.1 Distribution of habitats

While habitat mapping could not be conducted, some broad patterns in the distribution of habitats could be identified.

The majority of the survey area was found to be composed of two main habitats. In the inshore, rocky hard substrate characterised by dense foliose red seaweeds (IR.HIR.KFaR.FoR and IR.MIR.KR.XFoR) was found to be the dominant habitat type present, interspersed with areas of red seaweeds on pebbles and cobbles (SS.SMp.KSwSS.LsacR.CbPb). Further offshore, this habitat appears to give way to pebble and cobble plains, characterised by encrusting biota (SS.SCS.CCS.PomB) or *F. foliacea* and *H. oculata* (CR.HCR.XFa.FluHocu).

The westernmost section of the survey area, offshore of Weybourne, was found to be characterised by rippled sands (SS.SSa). This habitat was also identified in the extreme east of the survey area, on dives 16 – 19, though it was absent from the central sections of the survey area.

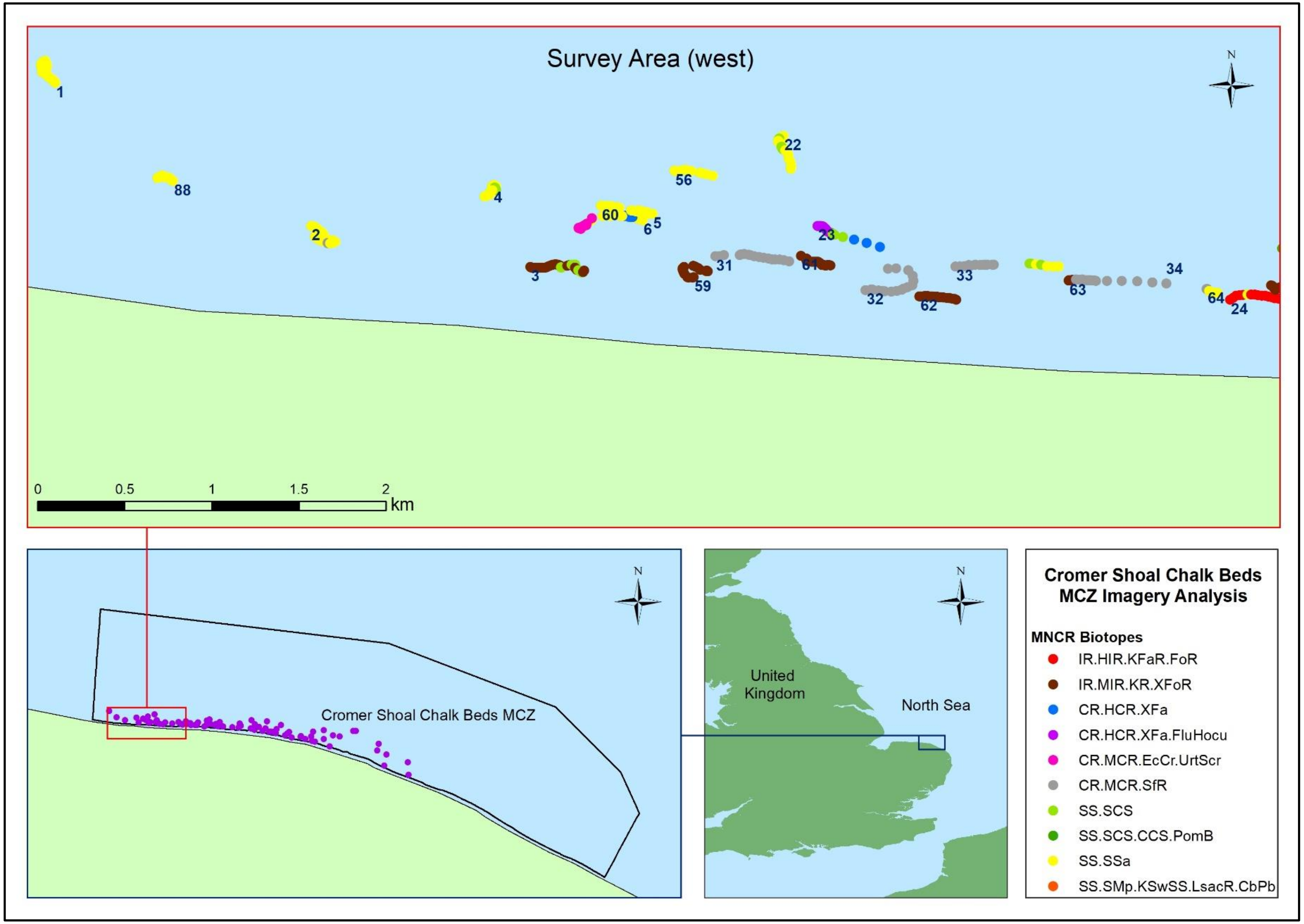


Figure 3.1: MNCR biotopes (as per Connor *et al*., 2004) assigned to video segments as part of the analysis of ROV video footage collected from the CSCB MCZ in 2021 (1 of 4).

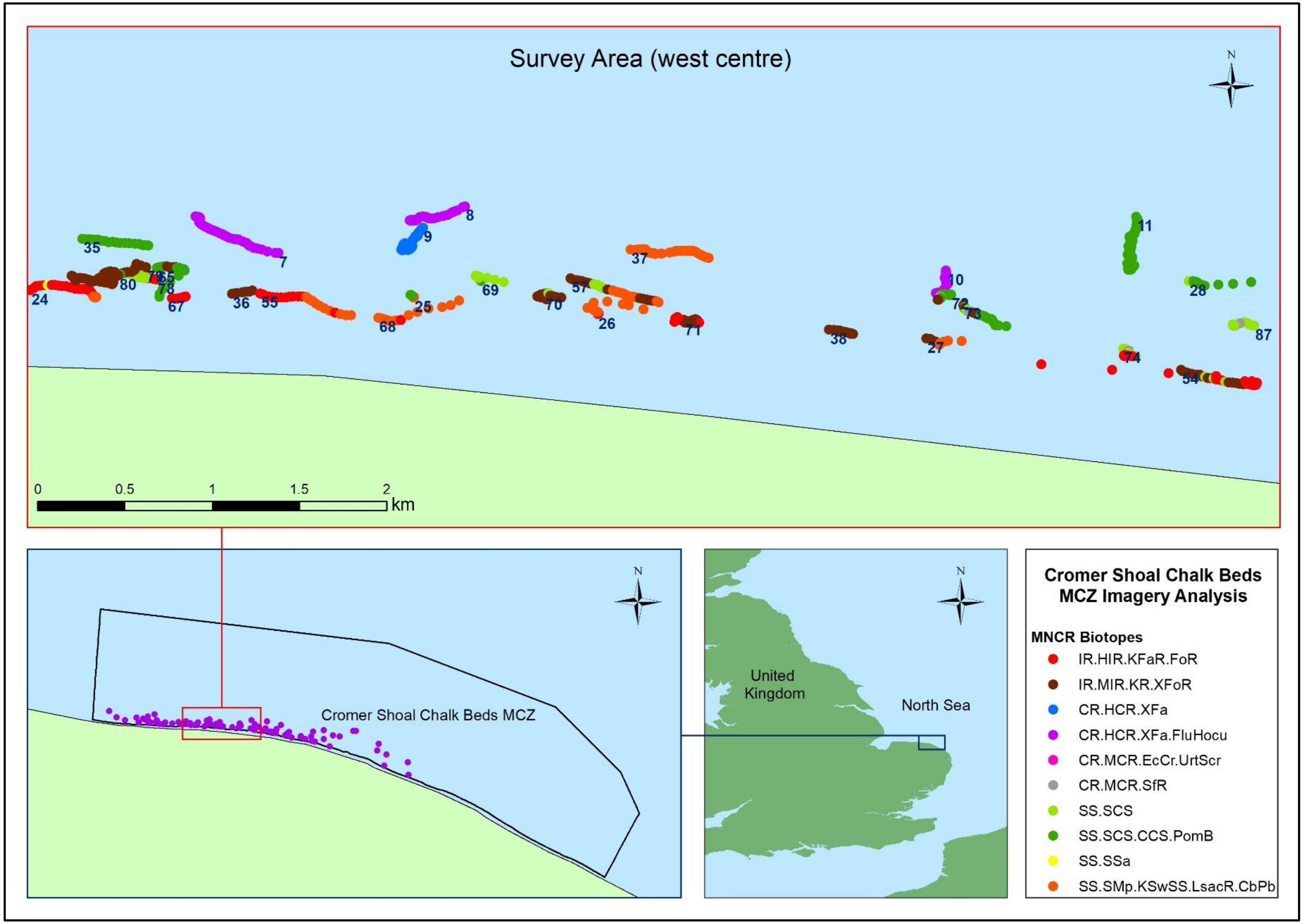


Figure 3.2: MNCR biotopes (as per Connor *et al*., 2004) assigned to video segments as part of the analysis of ROV video footage collected from the CSCB MCZ in 2021 (2 of 4).

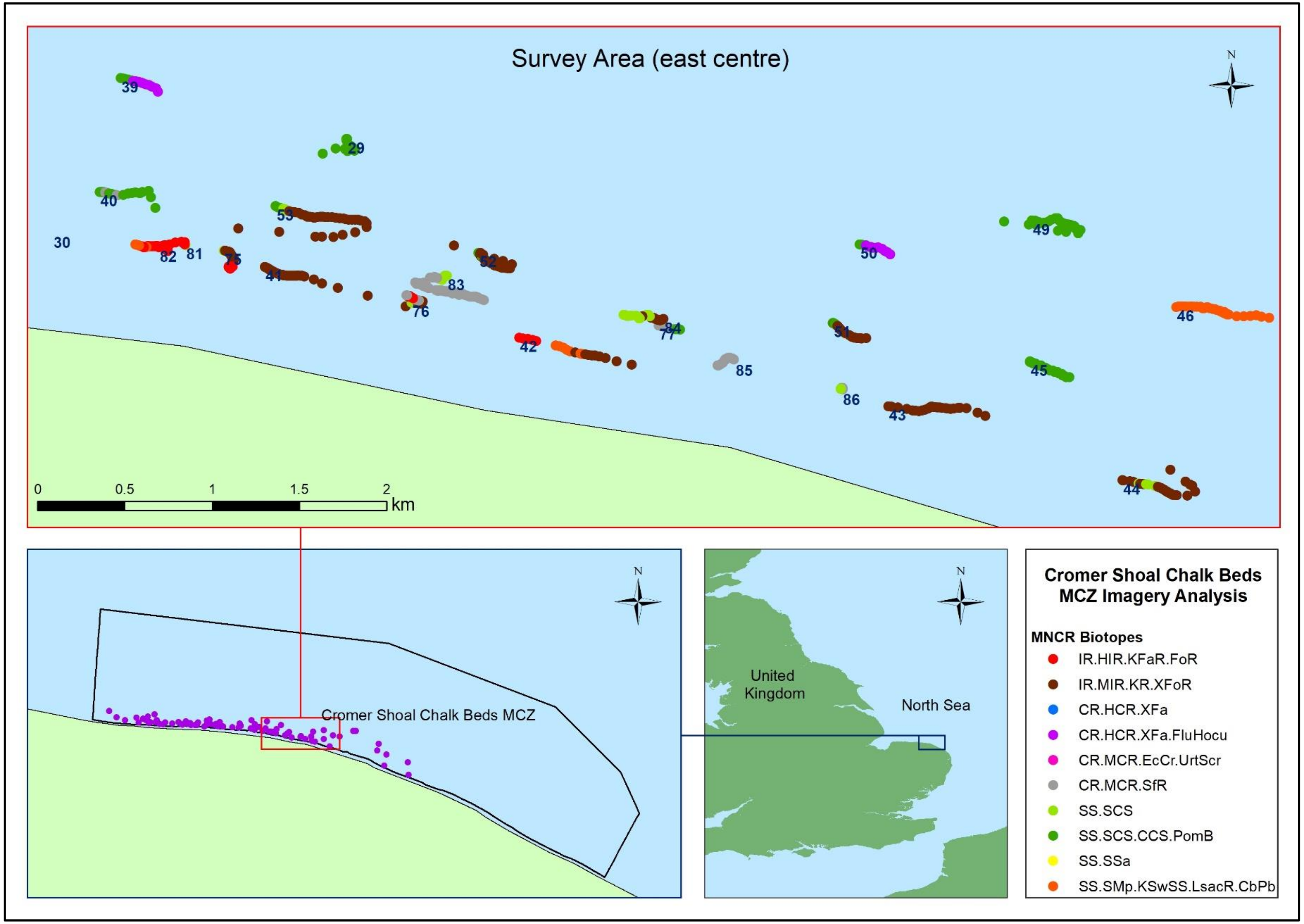


Figure 3.3: MNCR biotopes (as per Connor *et al*., 2004) assigned to video segments as part of the analysis of ROV video footage collected from the CSCB MCZ in 2021 (3 of 4).

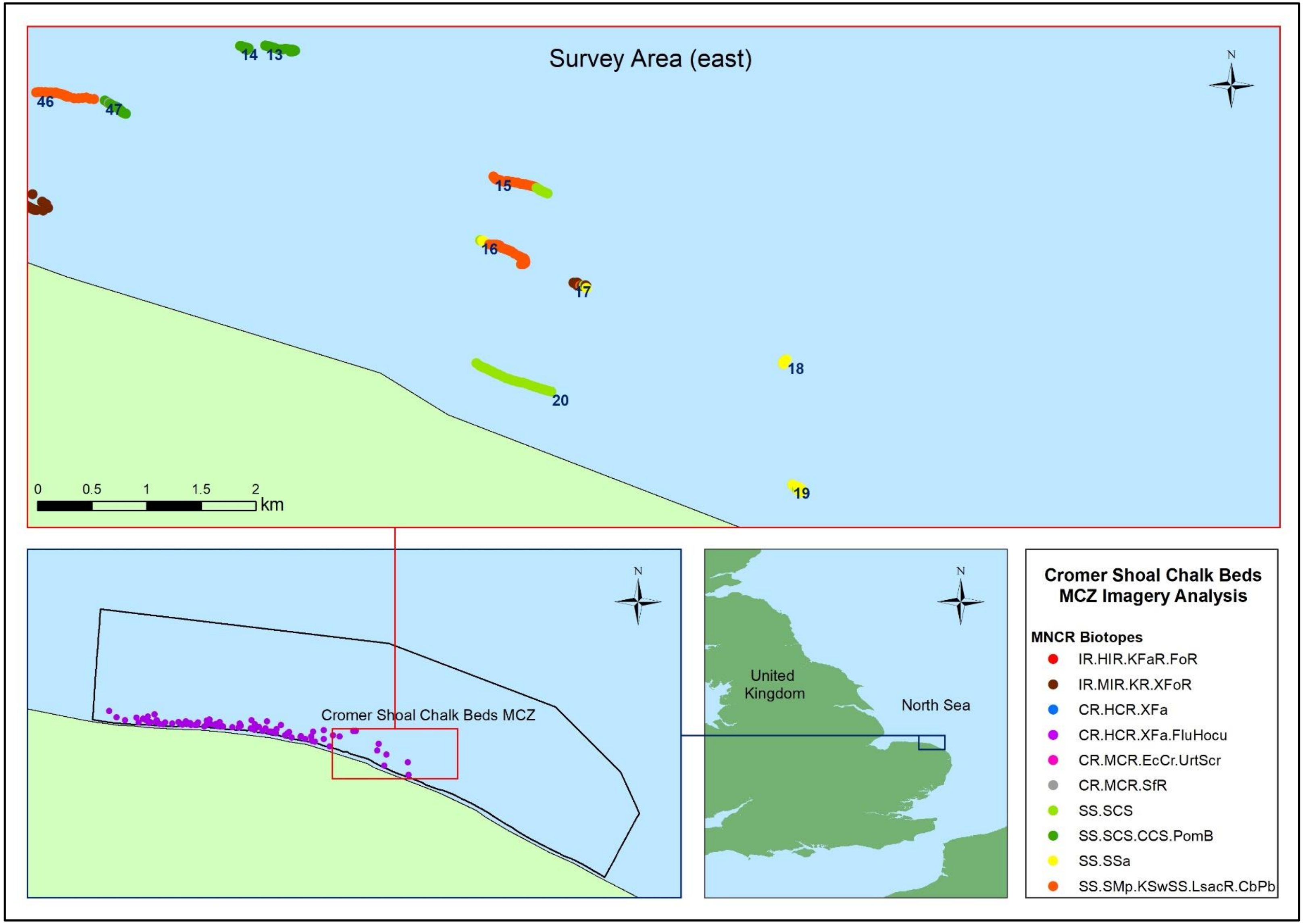


Figure 3.4: MNCR biotopes (as per Connor *et al*., 2004) assigned to video segments as part of the analysis of ROV video footage collected from the CSCB MCZ in 2021 (4 of 4).

3.2 Chalk assessment categories

Chalk was recorded on a total of 71 video tows and was present in a variety of forms, including pebbles and cobbles, flat chalk pavement and rugged chalk.

Chalk pebbles and cobbles were generally present as relatively flat plains in the offshore-most regions of the survey area, and were often intermingled with non-chalk (likely flint) pebbles. However, sparse and/or patchy chalk pebbles and cobbles were also observed overlying rippled sands, or lying atop or adjacent to rugged chalk bedrock outcrops throughout the survey area.

Chalk pavement exhibited a patchy distribution within the survey area and was generally observed as small patches of exposed rock under a thin veneer of coarse sediment (rippled sands and/or pebbles and cobbles). However, larger areas with a more silty appearance were also present, generally adjacent to areas of rugged bedrock.

Rugged chalk was generally present as bedrock outcrops or ‘ridges’ interspersed with gullies composed of coarse sediment, flat chalk pavement with a sediment veneer, or pebbles and cobbles. A variety of chalk structural complexity descriptor categories were recorded, including gullies, caves, stacks and arches. Rugged chalk bedrock was frequently observed as being covered with a thin veneer of silt, though areas of ‘clean’ chalk bedrock, generally characterised by dense red and brown seaweeds, were also observed. Large chalk boulders were also occasionally recorded, either as sparse individual boulders overlying sand, or alongside bedrock and cobbles.

The distribution of chalk assessment categories is shown in Figures 3.5 – 3.8.

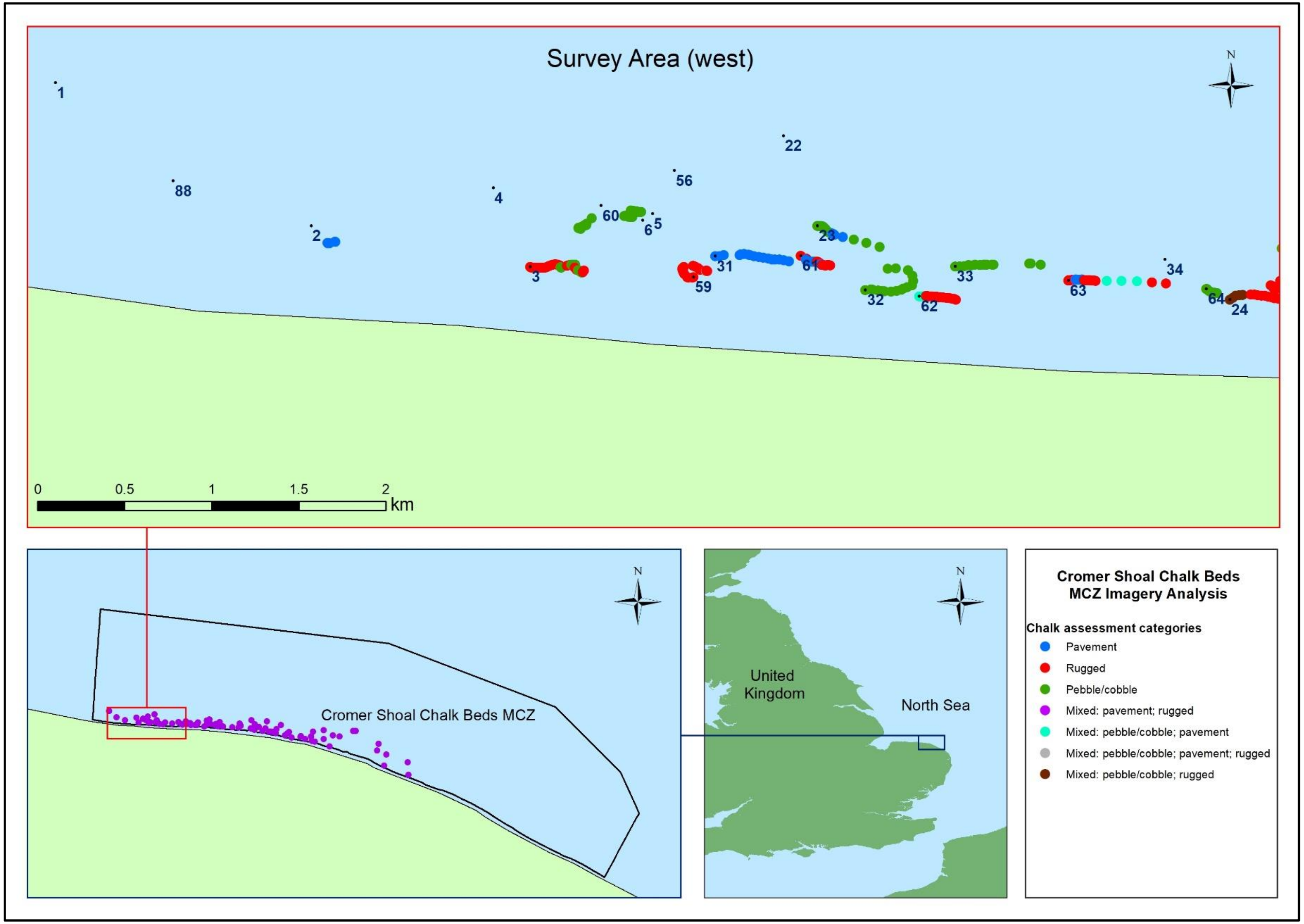


Figure 3.5: Chalk assessment categories assigned to video segments as part of the analysis of ROV video footage collected from the CSCB MCZ in 2021 (1 of 4).

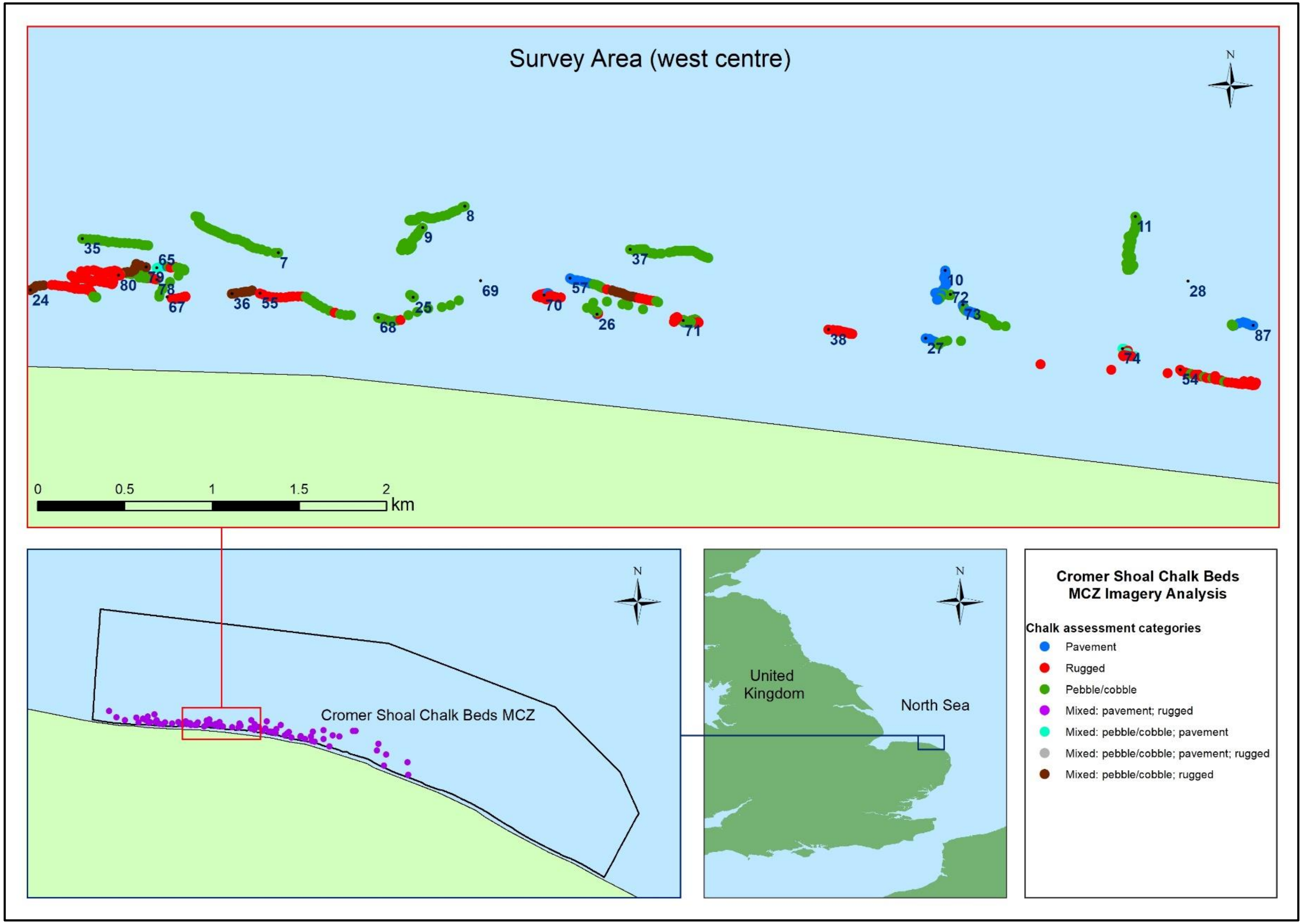


Figure 3.6: Chalk assessment categories assigned to video segments as part of the analysis of ROV video footage collected from the CSCB MCZ in 2021 (2 of 4).

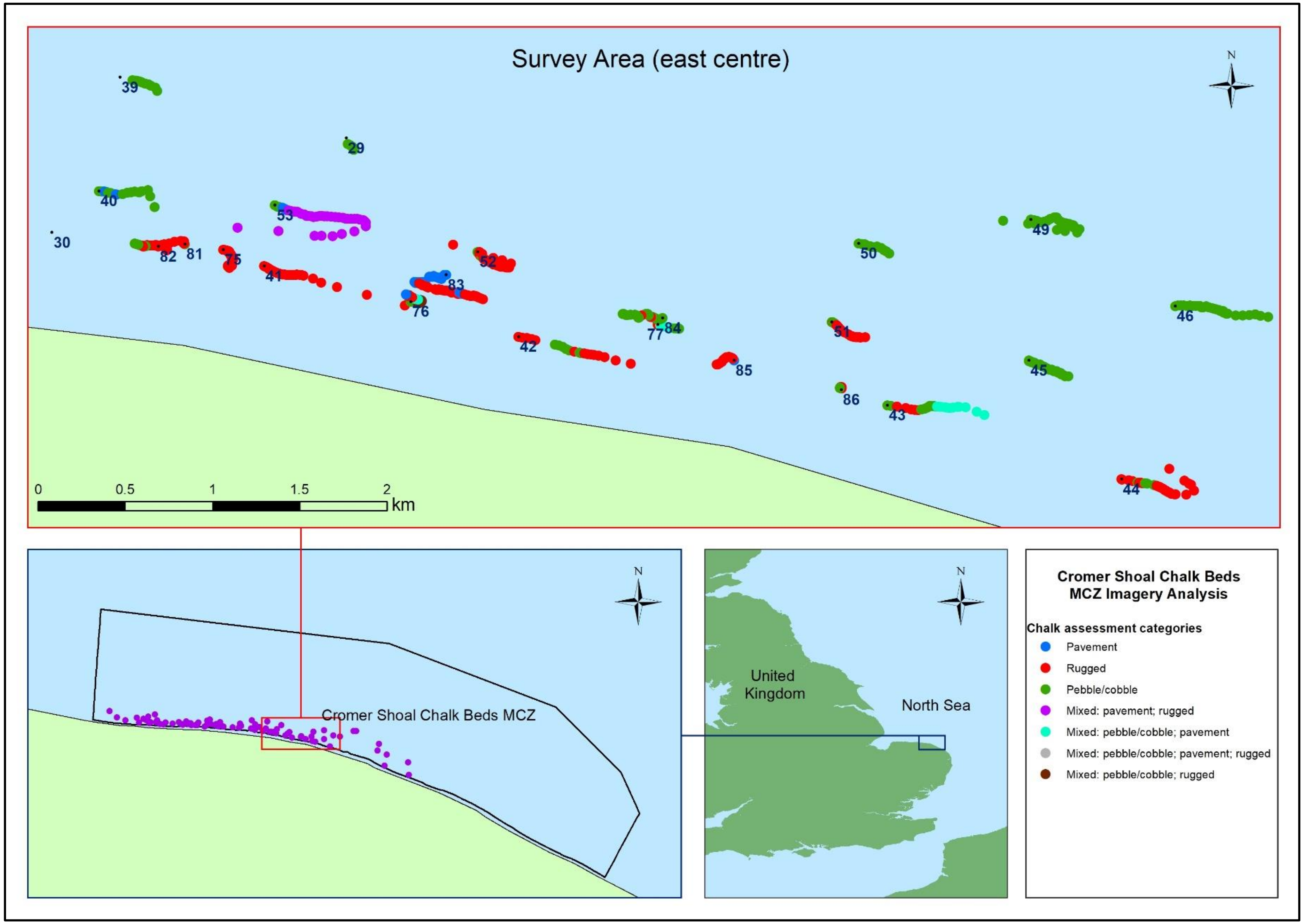


Figure 3.7: Chalk assessment categories assigned to video segments as part of the analysis of ROV video footage collected from the CSCB MCZ in 2021 (3 of 4).

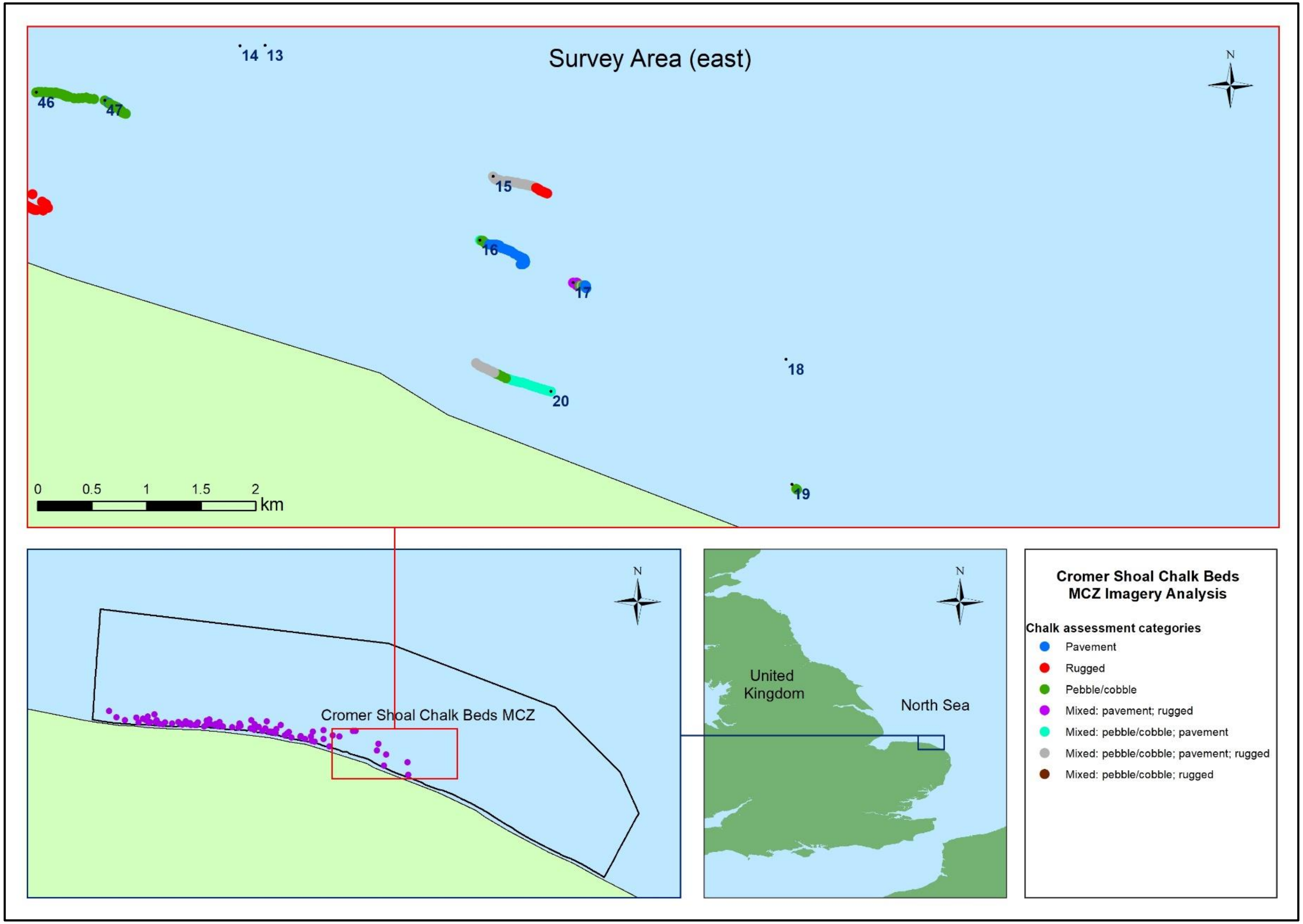


Figure 3.8: Chalk assessment categories assigned to video segments as part of the analysis of ROV video footage collected from the CSCB MCZ in 2021 (4 of 4).

3.3 Anthropogenic impacts

A total of 45 fishing pots were observed on the video footage. Two of these, both on dive 05, were recorded as being lost; the first pot appeared to be overgrown with fauna and squid eggs, while the second was half-buried in sand, though several brown crabs were present inside.

In addition to the pots, a total of five anchors were observed. Four of these were observed in association with fishing gear, however one anchor, on dive 46, was not attached to any rope and was therefore recorded as lost.

Litter was observed on three tows (dives 13, 14 and 15). The items recorded included fabric, cardboard and an unidentified plastic object.

3.3.1 Chalk impacts

A total of 76 chalk impacts were recorded from 22 tows, however, due to video quality issues, several potential chalk impacts could not be properly assessed and were therefore not recorded, though observations were noted as comments. The actual number of chalk impacts present is therefore likely to be higher than recorded.

The most common form of chalk impact observed was grating (also recorded as ‘grates’ where assessment was difficult or uncertain). For the most part, these were small patches (recorded as head to arm size) where epibiota and the surface level of chalk had been removed from the vertical face of a rugged chalk outcrop (Figure 3.9a). Rarely was chalk debris observed below the impact site, however it was common to observe multiple bare chalk patches of a similar size in a small area on the same rock face (Figure 3.9b). The cause of impact was not generally apparent, though on occasion pots were observed in the vicinity of the impacts or elsewhere on the tow.

Cuts (Figure 3.9c) were recorded 11 times during the analysis. In all cases, rope associated with fishing gear was present in-situ. In some cases, multiple impacts caused by the same rope were observed in the same frame. A single burn impact, also with rope present in-situ, was observed on dive 83 (Figure 3.9d), and one instance of level shear of a small area of rugged chalk, likely caused by a rope present in the nearby vicinity, was recorded on dive 71 (Figure 3.9e).

Angular rubble (also recorded as the broad impact category ‘rubble’) was occasionally observed in the survey area, being recorded on two tows (dives 72 and 75). These instances were relatively clear examples of chalk impact, being present as fairly large (torso sized) rubble ‘heaps’ (Figure 3.9f), however, where angular chalk cobbles were observed in isolation, or where video quality prevented a reasonable assessment of cobble shape, chalk impacts were not recorded.

Other forms of chalk impact recorded included abrasion and strikes, though these were relatively rarely observed.

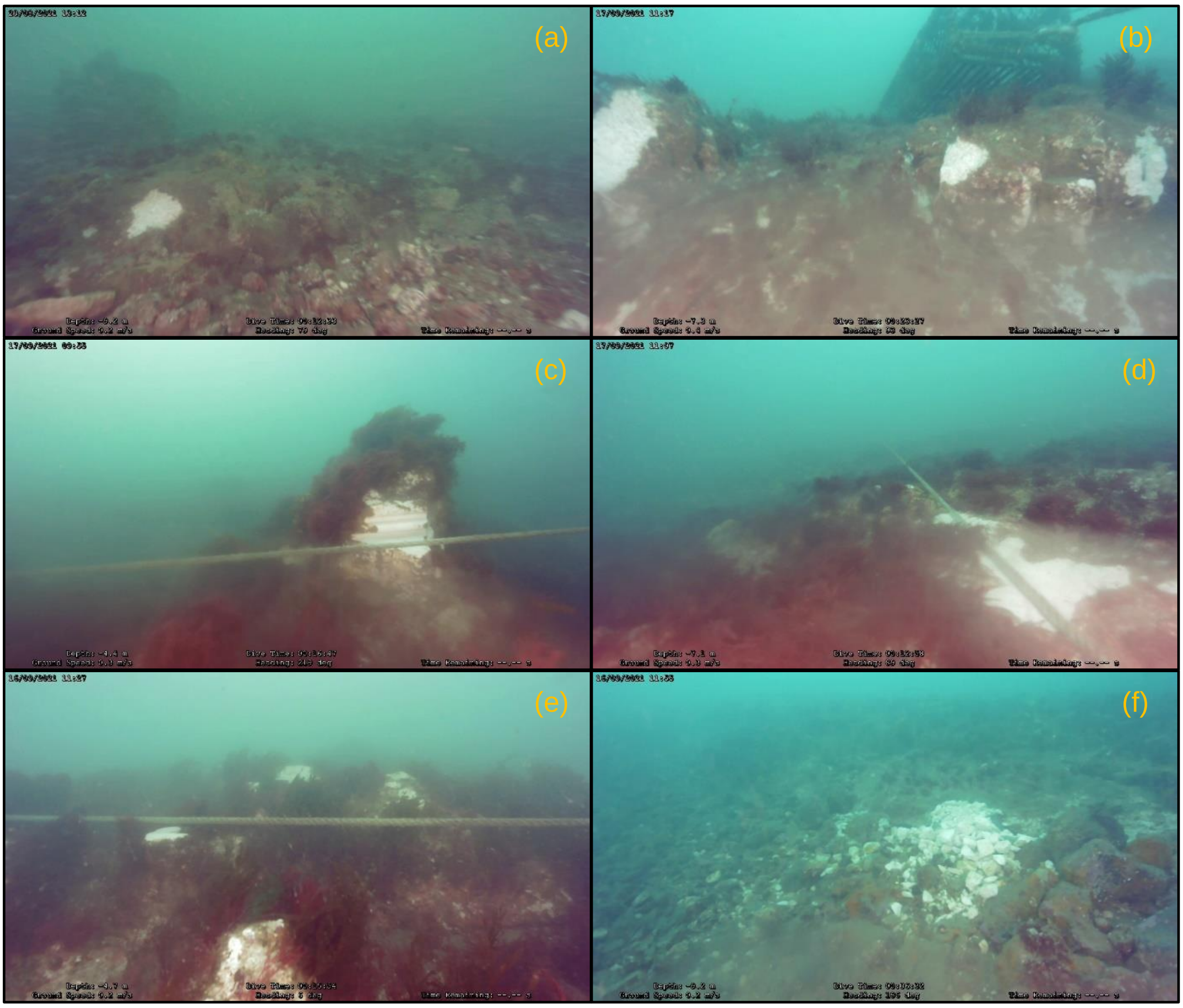


Figure 3.9: Examples of types of chalk impacts identified as part of the analysis of ROV video footage collected by EIFCA from CSCB MCZ in summer 2021: (a) single grating; (b) multiple grates on chalk outcrop with pot in situ; (c) cut on chalk stack; (d) burn; (e) level shear; (f) chalk rubble.

The highest numbers of chalk impacts were observed in the central east region of the survey area. In particular, high numbers of impacts were recorded offshore of East Runton, with 34 chalk impacts recorded from 7 tows, with 12 separate impacts (including grates, strikes, abrasions, burns and cuts) observed on dive 83 alone. In the same region, an additional five impacts from three tows were recorded offshore of Cromer.

In the central west region of the survey area, offshore of Sheringham and Beeston, a total of 28 chalk impacts were recorded from 8 tows. The majority of the impacts observed in this area were recorded either grates or cuts.

Comparatively few chalk impacts were recorded in the west of the survey area, with nine chalk impacts recorded from four tows; all of these impacts were recorded either as grating or grates.

4 DISCUSSION

4.1 Limitations

Most of the videos were assessed as being of ‘poor’ quality. This was due to a number of factors, including high transit speed, which caused significant motion blur in some cases, and low lighting levels, which made identification of biota difficult. As such, small or cryptic fauna are unlikely to have been identified, several species identifications are to a low level (e.g. ‘unidentified red algae (foliose)’; ‘unidentified faunal turf’) or were tentative. The low light levels were particularly problematic for the identification of seaweeds (red and brown seaweeds were often indistinguishable). Efforts were made to accurately quantify all observed biota however species abundances from videos flagged as ‘poor’ should be treated with caution.

Biotope assignments were based primarily on the biota present, however where the biota was sparse, biotopes were generally recorded at the habitat complex level (level 3). Assessment of substrate types, and hence assignment of coarse/sandy/muddy sediment habitat complexes, was based on expert judgement. Without supporting data from sediment sample analysis there can be some uncertainty in the assessment of the quantities of gravel, sand and mud present. Some biotopes may therefore be subject to change.

There was a low degree of positional accuracy for the data associated with this survey. It is recommended that caution should be taken when using the results data for any further analyses; in particular it is recommended that data should not be used for habitat mapping projects or the ground-truthing of acoustic data.

4.2 Conclusions

Due to the overall poor to very poor quality of the video records, it is difficult to draw confident conclusions from the data. In addition, the low positional accuracy of the navigation data mean that densities of fauna, chalk impacts etc. cannot be calculated with precision. Quantitative comparisons with other datasets are therefore not recommended, particularly with regards to epibiota.

Previous work examining chalk impacts in CSCB MCZ has suggested that the type and severity of chalk impacts varies across the site. Tibbitt *et al*. (2020) reported that dive sites at West Sheringham and West Runton exhibited greater proportions of abrasion, shear and strike damage types, whereas at East Runton there was a higher incidence of rubble, strike and unlevel shear damage types, with relatively fewer abrasions. In addition, it was determined that the dive site at West Sheringham was most impacted by severe anthropogenic-induced chalk damage. By contrast, the analysis of the ROV video footage in the present study suggests that the worst chalk damage occurs offshore of East Runton. In addition, cuts appeared to be a more prevalent form of damage compared with strikes and abrasions. Due to the significant differences in sampling method, however, and as impact density cannot be accurately estimated using the data from the current study, it is suggested that additional work is carried out to better map the distribution, type and severity of chalk impacts throughout the site.

4.3 Recommendations for future work

The usefulness of the data collected was negatively impacted by several factors associated with survey methodology, and there are several areas in which significant improvements could be made. While the survey was primarily used to trial the ROV equipment, it should be noted that data resulting from such *ad hoc* surveys are generally of limited use and it is recommended that future surveys be planned in more detail in order to address a particular aim.

It was noted by the personnel undertaking the survey that the ROV could not be reliably flown due to the local conditions and was therefore instead towed for the majority of the survey. If this is the case, it is recommended that a more appropriate drop-camera system be used instead of an ROV; depending on the system used, this would also have the benefit of enabling high quality still photographs to be taken, which in turn would allow more accurate identification of taxa and substrate type than can be achieved using video. Consideration should be given to the use of a survey vessel appropriate to the equipment being deployed.

It is recommended that particular attention be given to improving GPS positioning in order to reduce errors in the survey navigation data. This is particularly important for mapping surveys, regardless of whether the focus is on assessing the distribution and extent of geological features (as was the original aim of this survey) or of ecological communities. It is recommended that an appropriate, fit-for-purpose GPS system is used for future surveys, ideally one that is mounted on the vessel with known offsets and which is used in combination with navigation / survey management software which allows for calculation of camera layback. If, however, the same system is used again in the future, it is strongly recommended that several changes are made to the way in which positional data are recorded. These include keeping the GPS on deck where positional accuracy will be higher, logging data at regular (e.g. 1 sec) intervals, and recording the accuracy of the GPS whenever waypoints are taken.

In general, more attention should be given to collection of field metadata. It is strongly recommended that a more systematic approach is taken to the recording of tow metadata, for example by logging the start and end of line times at a set point in the deployment process (e.g. when the camera is put in the water, when the seabed is first seen, when recovery begins), and ensuring that all necessary data are logged for each and every deployment. All logged times should be recorded to the second. Recording times to the minute creates a high degree of uncertainty in the positional data: assuming a speed of 1 kn, recording to the minute introduces up to ~30 m of positional error before other factors are taken into account and should therefore not be considered sufficient. Assuming that navigation data are being logged at a suitable interval (e.g. 1 sec), recording accurate times enables the exact position at that time to be extracted from the logged positional data, and removes the need for GPS positions and waypoints to be manually captured. It is also important that all clocks used in the survey (camera clock, clapperboard clock etc.) be synced with the GPS time (again, to the second) at the start of each survey day (and double-checked every time the equipment is switched off) to avoid confusion and to enable e.g. the camera overlay to be used to calculate time and position if human error means that an accurate SOL time was not recorded. Field logs should also include comments for each tow that are pertinent to the post-survey analysis. Noting e.g. observed species is not particularly important in the field as this will be captured during the analysis process, however depth information should be recorded as this is very useful in both identifying taxa and assigning biotopes. In addition, if there are different methodologies being employed during the survey, such as towing vs flying the ROV, it is important that this be recorded in the field logs for each tow. It was noted that, in the field logs for this survey, the personnel acquiring the data consistently overestimated video quality. Training should be provided for field personnel to enable more accurate assessments of video quality to be undertaken so that, if necessary and practicable, video tows can be re-run in order to obtain suitable quality data.

Video data quality was low throughout the survey, and while this was in part due to local conditions, particularly the high turbidity present around chalk reef features (something which is fairly common), there are some improvements which could be made to the deployment method to improve data quality. If an ROV (or camera system) is to be towed, it is recommended that the ROV/camera be mounted in a frame on which a four-point tow system is used, rather than the two-point tow system used in the current survey, and that the camera umbilical is taped at regular intervals to the tow rope/cable as the camera is lowered to the seabed during deployment. This would mean that the tow rope and umbilical should not be visible in the field of view and that features and taxa are (i) less likely to be obscured and (ii) less likely to be impacted by trailing cables. The camera should be towed as slowly as possible to enable the post-survey analyst to better identify features and taxa present. Ideally, vessel speed should not exceed 0.5 kn, and reducing this further generally results in higher quality video data. The camera should be kept as close to the seabed as practicable whilst ensuring a reasonable field of view to enable the features of interest (e.g. geological features, taxa) to be readily and consistently visible and identifiable. If the camera is to be lifted for a portion of the tow, details should be recorded in the field log.

While it is acknowledged that the operators were using the survey to familiarise themselves with the equipment, when the ROV was flown rather than towed the changes of speed, direction and camera angle were often highly abrupt, making analysis of the video data difficult. Furthermore, there were several occasions on which the ROV was flown back over the same ground, which made accurate enumeration of taxa problematic. Where the aim of the survey is to quantify taxa, re-running over the same area of seabed on a single tow should ideally be avoided; otherwise, notes detailing the times that this occurs should be made in the field log to assist the analyst.

For all surveys, a field report should be produced (ideally by the same personnel who undertook the survey) detailing the exact methods used, and this should be kept/presented together with the field data. Monitoring an area, whether in terms of anthropogenic impacts or ecological change, requires that surveys are repeatable and comparable. Unless details of the exact methods used are recorded, it is unlikely that a survey will have long-term usefulness.

In order to fully address the stated aims of this survey, it is likely that additional surveys will be required, however it is strongly advised that the recommendations detailed here be implemented prior to any further attempts. The authors of this report are happy to provide our expertise to advise how best these and other surveys can be conducted and are confident that, with some changes to methodology, accurate, reliable and good quality data can be obtained.

5 REFERENCES

Althaus, F., Hill, N.A., Edwards, L. and Ferrari, R. (2014). CATAMI Classification Scheme for scoring marine biota and substrata in underwater imagery - A pictorial guide to the Collaborative and Annotation Tools for Analysis of Marine Imagery and Video (CATAMI) classification scheme. Version 1.4 – December 2014. Downloaded from https://github.com/catami/classification. Accessed August 2021.

Centre for Environment Fisheries & Aquaculture Science. (2016). Cromer Shoal Chalk Beds rMCZ 2013 Survey Report.

Connor, D.W., Allen, J. H., Golding, N., Howell, K. L., Lieberknecht, L. M., Northen, K. O. and Reker, J. B. (2004). *The Marine Habitat Classification for Britain and Ireland Version 04.05. In:* JNCC (2015) *The Marine Habitat Classification for Britain and Ireland Version 15.03* [Online]. Available from: https://mhc.jncc.gov.uk/. ISBN 1 861 07561 8. Accessed March 2022.

Folk, R. L. (1954). The distinction between grain size and mineral composition in sedimentary rock nomenclature. *Journal of Geology,* **62**, 344-359.

Green, S. C., R. and Dove, D. (2015). Cromer Shoal Chalk Beds rMCZ Post-survey Site Report. Report no. 34, ver. 5. Department for Environment Food and Rural Affairs. London, 70 pp.

Howson, C.M. and Picton, B.E. (1997). The species directory of the marine fauna and flora of the British Isles and surrounding seas. Ulster Museum Publication, 276. The Ulster Museum: Belfast, UK.

Irving, R. (2009). The identification of the main characteristics of stony reef habitats under the Habitats Directive. Summary report of an inter-agency workshop 26-27 March 2008. JNCC Report No. 432.

Joint Research Centre (2013). Guidance on Monitoring of Marine Litter in European Seas. Reference Report by the Joint Research Centre of the European Commission. Downloaded from https://mcc.jrc.ec.europa.eu/documents/201702074014.pdf.

JNCC and Natural England (2010). Marine Conservation Zone Project – Ecological Network Guidance. Downloaded from: https://hub.jncc.gov.uk/assets/94f961af-0bfc-4787-92d7-0c3bcf0fd083. Accessed March 2021.

Moffat, C., Richardson, H., and Roberts, G. (2019). Natural England marine chalk characterisation project. Natural England Research Reports, Number 080.

Parry, M.E.V. 2019. Guidance on Assigning Benthic Biotopes using EUNIS or the Marine Habitat Classification of Britain and Ireland (Revised 2019), JNCC Report No. 546, JNCC, Peterborough, ISSN 0963-8091.

Tibbitt, F., Love, J., Wright, J., and Chamberlain, J. (2020). Human Impacts on Cromer Shoal Chalk Beds MCZ: Chalk complexity and population dynamics of commercial crustaceans. Natural England Research Report number 04412.

Turner, J.A., Hitchin, R., Verling, E., van Rein, H. (2016). Epibiota remote monitoring from digital imagery: Interpretation guidelines.

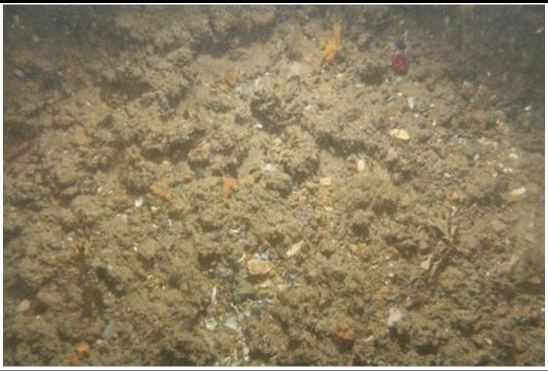
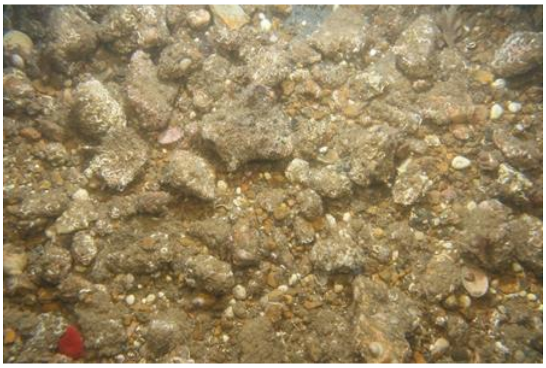
WoRMS Editorial Board. (2022). World Register of Marine Species. Available from: http://www.marinespecies.org at VLIZ (Accessed: 23/03/2022).

6 APPENDICES

Appendix I: Analysis guidance

Details of the categories used in the analysis of the ROV video footage collected from CSCB MCZ in 2021 by EIFCA and associated still frames. Based on the guidance document created by EIFCA for Seastar.

Chalk assessment categories

Category	Description	Example
Absent	Chalk not observed	
Pebble/cobble	Seabed predominantly made up of pebble/cobble	
Chalk pavement	Flat chalk pavement/ veneered chalk observed	
Rugged chalk	Elevated and complex chalk features/chalk boulders observed	

Dominant rock type

Dominant rock type	Description
Chalk	Seabed dominated by chalk
Other	Seabed dominated by rock that is not chalk (e.g. flint)
Mixed	Seabed dominated by chalk and other rock types
NA	Seabed dominated by mobile sediment

Chalk feature definitions

Feature type	Description
Chalk pebble	Chalk less than 64 mm in diameter.
Chalk cobble	Chalk between 64 mm and 256 mm in diameter.
Chalk boulder	Chalk greater than 256 mm in diameter.
Chalk pavement	Chalk bedrock visible on the surface of the seabed but topographically indistinct from the surrounding seabed. May be veneered with sediment in patches.
Chalk outcrop	Chalk outcrop visible on the surface of the seabed and topographically distinct from the surrounding seabed.
Fissures	Surface feature of outcropping chalk that forms a long narrow opening or line and is greater than 10 mm wide.
Crevices	Surface feature of outcropping chalk that forms a long narrow opening or line and is less than 10 mm wide.
Gullies	Outcropping chalk feature that forms the edge of a gully (a gap between two outcrops with sediment at the bottom).
Tunnels	Outcropping chalk feature that forms a tunnel (eroded area longer than it is broad or high).
Arches	Outcropping chalk feature that forms an arch (eroded area shorter than it is broad or high).
Overhangs	Outcropping chalk feature that forms an overhang (eroded area constrained above but not to both sides).
Caves	Outcropping chalk feature that forms a cave (eroded area constrained above and to both sides).
Stacks	Outcropping chalk feature that forms a stack (height of feature is greater than its horizontal dimensions) (forms a pinnacle).

Chalk impact categories (after Tibbitt *et al*., 2020)

Impact category	Associated severity	Corresponding broad impact category
Abrasion	Low	Grates
Drag	Low	Grates
Burn	Low	Cuts
Strike	Medium	Strikes
Cut	Medium	Cuts
Lift	High	Strikes
Grating	High	Grates
Angular rubble	High	Rubble
Saw	High	Cuts
Level shear	High	Cuts
Unlevel shear	High	Cuts

Broad chalk impact categories

Broad impact category	Description
Strikes	Areas of localised impact.
Grates	Less localised damage or abrasion.
Cuts	Impacts caused by ropes cutting into chalk.
Rubble	Areas of spread chalk fragments.

Severity of impact categories

Severity	Definition
Low	Surface layer of chalk removed.
Medium	Chalk structure broken but not removed.
High	Chalk structure is broken and removed.

Impact position categories

Impact position	Description
Seabed	On the seabed (e.g. if impact is to exposed flat chalk pavement).
Face (Bottom)	Bottom third of the face of an outcropping feature.
Face (Middle)	Middle third of the face of an outcropping feature.
Face (Top)	Top third of the face of an outcropping feature.
Top	On top of an outcropping feature.
Multiple (Seabed and bottom)	Impact extends across multiple positions across seabed and bottom of outcropping feature.
Multiple (Middle and top)	Impact extends across multiple positions across middle and top of outcropping feature.
Multiple (whole face)	Impact extends across the whole face (top, middle and bottom) of outcropping feature.

Impact extent categories

Impact extent	Description
Multiple small	Multiple small impacts in an area smaller than 2 x 2 m.
Hand	Area of impact estimated to be similar to the area of a hand (approximately <150 mm in diameter).
Head	Area of impact estimated to be similar to the area of a head (approximately <200 mm in diameter).
Arm	Area of impact estimated to be similar to the area of an arm (approximately <500 mm in diameter).
Torso	Area of impact estimated to be similar to the area of a torso (approximately <1 m in diameter).
Body	Area of impact estimated to be similar to the area of a body (approximately <2 m in diameter).
Severe	Area of impact estimated to be larger than the area of a body (approximately >2 m).

Impact cause categories

Impact cause	Description
Pot (P)	Pot (from potting gear) can be seen causing the impact.
Rope (P)	Rope (from potting gear) can be see causing the impact.
Anchor (P)	Anchor (from potting gear) can be seen causing the impact.
Buoy	Buoy can be seen causing the impact.
Anchor (other)	Anchor (from non-potting gear/unknown) can be seen causing the impact.
Net	Net can be seen causing the impact.
Hooks (A)	Hooks (from angling gear) can be seen causing the impact.
Line (A)	Line (from angling gear) can be seen causing the impact.
Weights (A)	Weights (from angling gear) can be seen causing the impact.
Other	Other anthropogenic object can be seen causing the impact (please specify in notes).
No visible interaction	Cause of impact not visible from video.

Presence of gear categories

Prescence of gear	Description
In situ	Gear in situ (direct observation of gear causing damage).
Vicinity	Gear in vicinity (within frame but not directly causing damage).
Area	Gear in area (gear in video but not observed in frame where damaged observed).
None	No gear present (No gear observed in segment).
Evidence of gear	Clear evidence of impact from gear but gear not observed in situ.

Feature type categories (of impacted chalk feature)

Feature type	Description
Chalk boulder/cobble on rock	Chalk boulder/cobble on rock.
Chalk boulder/cobble on sediment	Chalk boulder/cobble on sediment.
Chalk pavement	Chalk bedrock visible on the surface of the seabed but topographically indistinct from the surrounding seabed. May be veneered with sediment in patches.
Chalk outcrop	Chalk outcrop visible on the surface of the seabed and topographically distinct from the surrounding seabed.
Fissure	Surface feature of outcropping chalk that forms a long narrow opening or line and is greater than 10 mm wide.
Crevice	Surface feature of outcropping chalk that forms a long narrow opening or line and is less than 10 mm wide.
Gully	Outcropping chalk feature that forms the edge of a gully (a gap between two outcrops with sediment at the bottom).
Tunnel	Outcropping chalk feature that forms a tunnel (eroded area longer than it is broad or high).
Arch	Outcropping chalk feature that forms an arch (eroded area shorter than it is broad or high).
Overhang	Outcropping chalk feature that forms an overhang (eroded area constrained above but not to both sides).
Cave	Outcropping chalk feature that forms a cave (eroded area constrained above and to both sides).
Stack	Outcropping chalk feature that forms a stack (height of feature is greater than its horizontal dimensions) (forms a pinnacle).

Appendix II: Video analysis summary

A summary of the results obtained from analysis of the ROV footage collected from CSCB MCZ by EIFCA in August and September 2021.

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
1	01_S1	00:04:53	Very poor	Scattered pebbles and cobbles on rippled sand with sparse red seaweeds and *Metridium dianthus*	SS.SSa SS.SCS	Subtidal sands and gravels	Other	Absent	
1	01_S2	00:09:06	Very poor	Rippled sand with sparse pebbles and cobbles	SS.SSa	Subtidal sands and gravels	Other	Absent	
2	02_S1	00:09:16	Very poor	Slightly shelly rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
2	02_S2	00:01:13	Zero	[Zero video quality]					
2	02_S3	00:05:38	Very poor	Slightly shelly rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
2	02_S4	00:01:23	Very poor	Faunal turf on sediment-influenced chalk bedrock	CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	
2	02_S5	00:02:47	Poor	Slightly shelly rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
2	02_S6	00:00:50	Poor	Rippled sand overlying chalk pavement with patchy pebbles, cobbles and boulders	SS.SSa CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
2	02_S7	00:00:51	Poor	Slightly shelly rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
3	03_S1	00:08:45	Poor	Sparse red seaweeds and mixed faunal turf on silty chalk bedrock, boulders, cobbles and pebbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	Grating
3	03_S2	00:01:02	Poor	Sparse biota on pebbles, cobbles and gravel with faunal turf and red seaweeds on occasional boulders	SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
3	03_S3	00:01:00	Zero	[Zero video quality]					
3	03_S4	00:00:56	Very poor	Sparse red seaweeds and mixed faunal turf on silty chalk bedrock with cobbles and pebbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
3	03_S5	00:01:37	Poor	Sparse red seaweeds and mixed faunal turf on silty chalk cobbles and pebbles	SS.SCS IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pebble/cobble	
3	03_S6	00:00:53	Poor	Red seaweeds on silty chalk bedrock with cobbles and pebbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
3	03_S7	00:03:17	Poor	Pebbles and cobbles on sand with occasional boulders and patches of exposed chalk bedrock	SS.SCS CR.MCR.SfR	Subtidal chalk	Mixed	Pebble/cobble	
3	03_S8	00:00:24	Poor	Faunal turf and red seaweeds on silty chalk bedrock and boulders with pebbles and cobbles	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Chalk	Rugged	
4	04_S1	00:05:23	Very poor	Slightly shelly rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
4	04_S2	00:02:40	Poor	Pebbles and cobbles overlying rippled sand	SS.SCS	Subtidal sands and gravels	Other	Absent	
4	04_S3	00:02:44	Poor	Rippled sand with sparse/patchy pebbles	SS.SSa	Subtidal sands and gravels	N/A	Absent	
5	05_S1	00:04:15	Poor	Rippled slightly shelly sand with faunal turf and *Metridium dianthus* on patchy cobbles and boulders	SS.SSa CR.HCR.XFa	Subtidal sands and gravels	Other	Absent	
6	06_S1	00:01:30	Very poor	Rippled slightly shelly sand with occasional cobbles and boulders	SS.SSa	Subtidal sands and gravels	Other	Absent	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
6	06_S2	00:01:20	Poor	*Flustra foliacea* and *Metridium dianthus* on pebbles, cobbles and boulders overlying sand	CR.HCR.XFa SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
6	06_S3	00:03:22	Poor	Rippled slightly shelly sand with sparse/patchy pebbles and cobbles	SS.SSa SS.SCS	Subtidal sands and gravels	Other	Absent	
6	06_S4	00:02:27	Zero	[Zero video quality]					
6	06_S5	00:00:41	Very poor	Rippled slightly shelly sand with sparse/patchy pebbles and cobbles	SS.SSa SS.SCS	Subtidal sands and gravels	Other	Absent	
6	06_S6	00:02:23	Poor	Pebbles and cobbles overlying sand with *Urticina felina*, *Metridium dianthus* and *Flustra foliacea*	CR.MCR.EcCr.UrtScr SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
7	07_S1	00:12:20	Poor	*Flustra foliacea* and *Haliclona oculata* on cobbles with faunal turf and faunal crusts	CR.HCR.XFa.FluHocu	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
8	08_S1	00:10:29	Poor	*Flustra foliacea* and *Haliclona oculata* on cobbles & pebbles with faunal turf and faunal crusts	CR.HCR.XFa.FluHocu	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
9	09_S1	00:10:17	Poor	Faunal crusts & *Flustra foliacea* on pebbles & cobbles with scour-tolerant taxa and sparse red algae	CR.HCR.XFa	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
9	09_S2	00:04:32	Zero	[Zero video quality]					
10	10_S1	00:07:28	Poor	*Flustra foliacea* and *Haliclona oculata* on cobbles & pebbles with faunal turf and faunal crusts	CR.HCR.XFa.FluHocu	Subtidal chalk Subtidal sands and gravels	Mixed	Pavement	
10	10_S2	00:03:55	Zero	[Zero video quality]					

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
11	11_S1	00:20:05	Poor	Faunal crusts on pebbles & cobbles with *Flustra foliacea* and sponges on sparse cobbles & boulders	SS.SCS.CCS.PomB CR.HCR.XFa	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
12	-			Video not analysed. Seabed not visible at any point during deployment.					
13	13_S1	00:09:52	Poor	Faunal crusts on pebbles & cobbles with *Flustra foliacea* and sponges on sparse cobbles & boulders	SS.SCS.CCS.PomB CR.HCR.XFa	Subtidal sands and gravels	Other	Absent	
14	14_S1	00:07:16	Poor	Faunal crusts on pebbles and cobbles with sparse red seaweeds and *Urticina felina*	SS.SCS.CCS.PomB	Subtidal sands and gravels	Other	Absent	
15	15_S1	00:14:34	Poor	Dense red seaweeds on chalk bedrock, cobbles and pebbles	SS.SMp.KSwSS.LsacR.CbPb IR.HIR.KFaR.FoR	Subtidal chalk	Mixed	Mixed: pebble/cobble; pavement; rugged	
15	15_S2	00:03:07	Poor	Cobbles and pebbles overlying shelly sand with patchy red seaweeds	SS.SCS SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk Subtidal sands and gravels	Mixed	Rugged	
16	16_S1	00:00:38	Poor	Pebbles and cobbles on rippled shelly sand with occasional exposed chalk pavement	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Mixed: pebble/cobble; pavement	
16	16_S2	00:02:59	Poor	Rippled shelly sand with sparse/patchy pebbles and cobbles	SS.SSa	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
16	16_S3	00:09:43	Poor	Red seaweeds on pebbles and cobbles with occasional exposed chalk pavement and rippled sand	SS.SMp.KSwSS.LsacR.CbPb CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Pavement	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
17	17_S1	00:05:40	Poor	Sparse red seaweeds on sand-covered chalk bedrock with patchy pebbles and cobbles overlying	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Mixed: pavement; rugged	
17	17_S2	00:01:22	Poor	Sparse red seaweeds on cobbles and pebbles overlying rippled shelly sand	SS.SMp.KSwSS.LsacR.CbPb SS.SSa	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
17	17_S3	00:01:39	Poor	Sparse red seaweeds on sand-covered chalk bedrock with patchy pebbles and cobbles overlying	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Mixed: pebble/cobble; pavement; rugged	
17	17_S4	00:01:23	Poor	Sparse biota on cobbles and pebbles overlying rippled shelly sand	SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
17	17_S5	00:02:37	Poor	Sparse red seaweeds on sand-covered chalk bedrock with patchy pebbles and cobbles overlying	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
17	17_S6	00:00:32	Poor	Rippled sand veneer over occasionally visible flat chalk bedrock with sparse red seaweeds	SS.SSa CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
18	18_S1	00:04:30	Poor	Rippled shelly sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
19	19_S1	00:02:44	Poor	Rippled shelly sand with sparse/patchy pebbles and cobbles	SS.SSa	Subtidal sands and gravels	Other	Absent	
19	19_S2	00:00:27	Poor	Pebbles and cobbles overlying rippled sand	SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
19	19_S3	00:02:04	Poor	Rippled shelly sand with sparse/patchy pebbles and cobbles	SS.SSa	Subtidal sands and gravels	N/A	Absent	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
19	19_S4	00:00:34	Poor	Exposed bedrock with thin veneer of rippled sand	SS.SSa	Subtidal sands and gravels	Other	Absent	
19	19_S5	00:01:01	Poor	Rippled shelly sand with patchy pebbles and cobbles	SS.SSa SS.SCS	Subtidal sands and gravels	N/A	Absent	
20	20_S1	00:05:16	Very poor	Patchy red seaweeds on pebbles and cobbles with patches of flat chalk bedrock also present	SS.SCS CR.MCR.SfR	Subtidal chalk	Mixed	Mixed: pebble/cobble; pavement	
20	20_S2	00:01:36	Very poor	Bare chalk-dominated pebbles and cobbles with occasional boulders featuring red seaweeds	SS.SCS	Subtidal chalk	Chalk	Pebble/cobble	
20	20_S3	00:02:21	Very poor	Patchy red seaweeds on pebbles and cobbles with patches of chalk bedrock also present	SS.SCS CR.MCR.SfR	Subtidal chalk	Mixed	Mixed: pebble/cobble; pavement; rugged	
21	21_S1	00:01:45	Good	Pebbles & cobbles overlying muddy sand w/ dense faunal turf, encrusting sponges & *Metridium dianthus*	CR.HCR.XFa SS.SMx		Other	Absent	
22	22_S1	00:00:36	Poor	Rippled shelly sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
22	22_S2	00:01:02	Poor	Pebbles and cobbles overlying rippled sand with sparse biota	SS.SCS	Subtidal sands and gravels	Other	Absent	
22	22_S3	00:01:46	Poor	Rippled shelly sand with sparse pebbles	SS.SSa	Subtidal sands and gravels	N/A	Absent	
22	22_S4	00:00:29	Poor	Pebbles and cobbles overlying rippled sand	SS.SCS	Subtidal sands and gravels	Other	Absent	
22	22_S5	00:01:27	Poor	Rippled shelly sand with sparse pebbles	SS.SCS	Subtidal sands and gravels	Other	Absent	
22	22_S6	00:02:33	Very poor	Rippled slightly gravelly shelly sand	SS.SSa	Subtidal sands and gravels	Other	Absent	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
23	23_S1	00:06:52	Poor	*Flustra foliacea* and sparse *Haliclona oculata* on cobbles and pebbles with hydroids and faunal crusts	CR.HCR.XFa.FluHocu	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
23	23_S2	00:01:20	Poor	Pebbles and cobbles overlying sand with patches of exposed chalk bedrock	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Pavement	
23	23_S3	00:00:56	Poor	Faunal turf with *Flustra foliacea* on pebbles, cobbles and boulders	CR.HCR.XFa SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
24	24_S1	00:01:35	Very poor	Red and brown seaweeds on bedrock, cobbles and pebbles with rippled sand infill	IR.HIR.KFaR.FoR SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk Subtidal sands and gravels	Chalk	Mixed: pebble/cobble; rugged	
24	24_S2	00:00:21	Poor	Rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
24	24_S3	00:02:11	Poor	Red and brown seaweeds on bedrock, cobbles and pebbles with rippled sand infill	IR.HIR.KFaR.FoR SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
24	24_S4	00:00:55	Very poor	Dense red and brown seaweeds on bedrock with sand infill	IR.HIR.KFaR.FoR	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
24	24_S5	00:02:01	Poor	Red and brown seaweeds on bedrock, cobbles and pebbles with rippled sand infill	IR.HIR.KFaR.FoR SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	Grates
24	24_S6	00:01:23	Poor	Dense red and brown seaweeds on pebbles and cobbles with patches of chalk bedrock	SS.SMp.KSwSS.LsacR.CbPb IR.HIR.KFaR.FoR	Subtidal chalk	Mixed	Pebble/cobble	
25	25_S1	00:01:17	Poor	Dense red seaweeds on pebbles and cobbles with *Amphilectus fucorum*	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Mixed	Pebble/cobble	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
25	25_S2	00:01:22	Poor	Encrusting fauna on pebbles and cobbles with sparse red seaweeds and areas of flat bedrock	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
25	25_S3	00:03:07	Zero	[Zero video quality]					
26	26_S1	00:00:41	Very poor	Seaweeds on sediment-affected hard substrate	CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	
26	26_S2	00:01:05	Poor	Dense red and brown seaweeds on chalk bedrock	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
26	26_S3	00:03:00	Poor	Red seaweeds on pebbles and cobbles with crustose communities	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Mixed	Pebble/cobble	
27	27_S1	00:02:37	Poor	Red seaweeds on sediment-affected cobbles and patchy bedrock with crustose communities	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pavement	
27	27_S2	00:00:25	Poor	Cobbles overlying sediment-affected chalk bedrock with red seaweeds	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pavement	
27	27_S3	00:01:30	Poor	Red seaweeds and crustose communities on pebbles and cobbles with sand and gravel infill	SS.SMp.KSwSS.LsacR.CbPb CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
28	28_S1	00:00:53	Very poor	Rippled gravelly shelly sand with pebbles	SS.SCS	Subtidal sands and gravels	Other	Absent	
28	28_S2	00:03:46	Poor	Encrusting fauna on pebbles and cobbles with sparse red seaweeds	SS.SCS.CCS.PomB	Subtidal sands and gravels	Other	Absent	
29	29_S1	00:01:36	Poor	Encrusting fauna on pebbles, cobbles and occasional boulders	SS.SCS.CCS.PomB	Subtidal sands and gravels	Other	Absent	
29	29_S2	00:00:26	Zero	[Zero video quality]					

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
29	29_S3	00:01:52	Poor	Encrusting fauna on pebbles, cobbles and occasional boulders	SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
29	29_S4	00:00:57	Zero	[Zero video quality]					
29	29_S5	00:00:59	Very poor	Encrusting fauna on pebbles, cobbles and occasional boulders	SS.SCS.CCS.PomB	Subtidal sands and gravels	Other	Absent	
30	30_S1	00:00:33	Zero	[Zero video quality]					
31	31_S1	00:01:12	Very poor	Silt-influenced chalk bedrock with areas of pebbles, cobbles and sparse boulders	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
31	31_S2	00:00:31	Zero	[Zero video quality]					
31	31_S3	00:03:29	Very poor	Silt-influenced chalk bedrock with areas of pebbles, cobbles and sparse boulders	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
32	32_S1	00:04:16	Very poor	Patchy red seaweeds on pebbles, cobbles and boulders	CR.MCR.SfR SS.SCS	Subtidal chalk	Chalk	Pebble/cobble	
33	33_S1	00:03:14	Very poor	Silt-influenced pebbles, cobbles and boulders with possible patches of chalk bedrock [uncertain]	CR.MCR.SfR SS.SCS	Subtidal chalk	Chalk	Pebble/cobble	
33	33_S2	00:01:20	Very poor	Silt-influenced pebbles and cobbles [uncertain]	SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
33	33_S3	00:00:21	Very poor	Rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
33	33_S4	00:00:28	Very poor	Chalk pebbles and cobbles on sand with possible patch of chalk bedrock [uncertain]	SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
33	33_S5	00:00:37	Very poor	Rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
34	34_S1	00:01:41	Zero	[Zero video quality]					

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
35	35_S1	00:05:57	Poor	Encrusting fauna on pebbles & cobbles with *Flustra foliacea* and *Haliclona oculata* on patchy boulders	SS.SCS.CCS.PomB CR.HCR.XFa.FluHocu	Subtidal chalk	Mixed	Pebble/cobble	
36	36_S1	00:01:41	Very poor	Dense red and brown seaweeds on chalk pebbles, cobbles and occasional boulders	IR.MIR.KR.XFoR	Subtidal chalk	Mixed	Mixed: pebble/cobble; rugged	
37	37_S1	00:08:54	Poor	Red seaweeds on pebbles and cobbles with *Flustra foliacea* and crustose communities	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Mixed	Pebble/cobble	
38	38_S1	00:03:36	Very poor	Red seaweeds on sediment-influenced cobbles and boulders	IR.MIR.KR.XFoR	Subtidal chalk	Mixed	Rugged	
38	38_S2	00:02:32	Zero	[Zero video quality]					
39	39_S1	00:01:21	Poor	Encrusting biota on pebbles and cobbles with sparse *Flustra foliacea*	SS.SCS.CCS.PomB	Subtidal sands and gravels	Other	Absent	
39	39_S2	00:02:43	Poor	*Flustra foliacea* and sparse *Haliclona oculata* on pebbles and cobbles with encrusting fauna	CR.HCR.XFa.FluHocu	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
40	40_S1	00:01:49	Poor	Encrusting biota on pebbles and cobbles with sparse patches of exposed flat chalk bedrock	SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
40	40_S2	00:00:23	Poor	Sediment-covered flat chalk bedrock with pebbles and cobbles overlying	CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	
40	40_S3	00:01:09	Poor	Encrusting biota on pebbles, cobbles and occasional boulders	SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
40	40_S4	00:00:28	Poor	Sparse red seaweeds on sediment-covered chalk bedrock with overlying pebbles, cobbles and boulders	CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	
40	40_S5	00:02:17	Poor	Encrusting biota on pebbles, cobbles and boulders with sparse patches of exposed chalk bedrock	SS.SCS.CCS.PomB CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
41	41_S1	00:11:31	Poor	Dense red seaweeds on slightly silty chalk cobbles, boulders and bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	Grating; Grates
42	42_S1	00:01:34	Poor	Red seaweeds on clean chalk bedrock, boulders and cobbles	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
42	42_S2	00:01:26	Zero	[Zero video quality]					
42	42_S3	00:01:48	Very poor	Red seaweeds on pebbles and cobbles	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Chalk	Pebble/cobble	
42	42_S4	00:00:20	Very poor	Red seaweeds on sediment-affected chalk bedrock with coarse sediment infill	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
42	42_S5	00:00:25	Very poor	Red seaweeds on pebbles and cobbles	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Chalk	Pebble/cobble	
42	42_S6	00:01:36	Very poor	Dense red seaweeds on sediment-affected chalk bedrock with coarse sediment infill	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	Grates
43	43_S1	00:00:24	Poor	Red seaweeds on silty cobbles and boulders	IR.MIR.KR.XFoR	Subtidal chalk	Mixed	Pebble/cobble	
43	43_S2	00:01:33	Poor	Red seaweeds on chalk bedrock, cobbles & boulders with coarse sediment infill/veneer	IR.MIR.KR.XFoR CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
43	43_S3	00:02:38	Poor	Red seaweeds on silty cobbles and boulders with patches of chalk bedrock	IR.MIR.KR.XFoR CR.MCR.SfR	Subtidal chalk	Mixed	Pebble/cobble	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
43	43_S4	00:00:42	Very poor	Red seaweeds on pebbles, cobbles, boulders and bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pebble/cobble	
43	43_S5	00:03:13	Poor	Red seaweeds on silty pebbles, cobbles and boulders with patches of chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Mixed	Mixed: pebble/cobble; pavement	
44	44_S1	00:01:58	Poor	Red seaweeds on silty chalk bedrock, boulders and cobbles with some coarse sediment infill	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
44	44_S2	00:00:27	Very poor	Pebbles and cobbles with sparse red seaweeds	SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
44	44_S3	00:01:32	Very poor	Sparse red seaweeds on silty cobbles and large boulders with coarse sediment infill	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
44	44_S4	00:01:02	Very poor	Pebbles and cobbles with sparse biota	SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
44	44_S5	00:04:45	Very poor	Patchy red seaweeds on silty chalk bedrock with patches of pebbles and cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	Grating; Grates
45	45_S1	00:05:44	Poor	Encrusting biota on pebbles, cobbles and occasional boulders	SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Other	Pebble/cobble	
46	46_S1	00:06:35	Poor	Red seaweeds and encrusting biota on pebbles and cobbles with patches of chalk bedrock	SS.SMp.KSwSS.LsacR.CbPb CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Other	Pebble/cobble	Grating
47	47_S1	00:00:42	Poor	Encrusting biota on pebbles and cobbles with sparse red seaweeds	SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Other	Pebble/cobble	
47	47_S2	00:00:56	Poor	Pebbles, cobbles and occasional boulders overlying flat chalk bedrock with sparse biota	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
47	47_S3	00:07:34	Poor	Encrusting biota on pebbles, cobbles and occasional boulders with patchy red seaweeds	SS.SCS.CCS.PomB CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Other	Pebble/cobble	
48	-			Video not analysed. Seabed not visible at any point during deployment.					
49	49_S1	00:02:50	Poor	Encrusting biota on pebbles and cobbles with sparse red seaweeds	SS.SCS.CCS.PomB	Subtidal chalk	Other	Pebble/cobble	
49	49_S2	00:03:30	Very poor	Encrusting biota on pebbles and cobbles with sparse red seaweeds	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
50	50_S1	00:00:38	Very poor	Encrusting biota on pebbles and cobbles with sparse red seaweeds	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
50	50_S2	00:02:05	Poor	Faunal crusts & red seaweeds on pebbles & cobbles with sparse *Flustra foliacea* & *Haliclona oculata*	CR.HCR.XFa.FluHocu	Subtidal chalk	Mixed	Pebble/cobble	
51	51_S1	00:01:17	Poor	Encrusting biota on pebbles and cobbles with red seaweeds on occasional large boulders	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
51	51_S2	00:00:30	Poor	Red seaweeds and *Amphilectus fucorum* on silt-affected large boulders overlying pebbles and cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Mixed	Rugged	
51	51_S3	00:00:58	Poor	Encrusting biota on pebbles and cobbles with red seaweeds on occasional large boulders	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
51	51_S4	00:05:00	Poor	Red seaweeds, *Amphilectus fucorum* & *Tubularia indivisa* on silty boulders overlying pebbles & cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Mixed	Rugged	
52	52_S1	00:00:42	Poor	Encrusting biota on pebbles and cobbles	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
52	52_S2	00:00:49	Poor	Red seaweeds and sponges on silty chalk bedrock with patches of flat chalk with sand veneer	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
52	52_S3	00:00:33	Poor	Encrusting biota on pebbles and cobbles	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
52	52_S4	00:05:24	Poor	Red seaweeds and sponges on silty chalk bedrock with sand/gravel gullies	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	Abrasion; Grating; Grates
53	53_S1	00:01:17	Poor	Encrusting biota on pebbles, cobbles and boulders with *Tubularia indivisa* and sparse red seaweeds	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
53	53_S2	00:00:43	Poor	Flat chalk bedrock with gravel/pebble veneer and occasional boulders with sponges and red seaweeds	SS.SCS CR.MCR.SfR	Subtidal chalk	Mixed	Pavement	
53	53_S3	00:10:30	Poor	Red seaweeds & sponges on cobbles & boulders overlying pebbles & gravel with patchy chalk bedrock	IR.MIR.KR.XFoR CR.MCR.SfR	Subtidal chalk	Mixed	Mixed: pavement; rugged	Grates
54	54_S1	00:00:37	Poor	Red seaweeds on silty chalk cobbles and boulders with sand and gravel infill	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
54	54_S2	00:00:22	Poor	Dense red seaweeds on silty chalk bedrock with pebble and cobble infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Chalk	Rugged	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
54	54_S3	00:00:27	Very poor	Red seaweeds and crustose communities on pebbles and cobbles overlying chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pebble/cobble	
54	54_S4	00:00:46	Very poor	Dense red seaweeds on silty chalk bedrock and boulders with pebble and cobble infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Chalk	Rugged	
54	54_S5	00:00:28	Very poor	Sparse red seaweeds on pebbles and cobbles with patchy encrusting biota	SS.SCS	Subtidal chalk	Chalk	Pebble/cobble	
54	54_S6	00:00:24	Very poor	Red seaweeds on silty chalk bedrock with pebble and cobble infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Chalk	Rugged	
54	54_S7	00:00:27	Very poor	Patchy/sparse red seaweeds on pebbles, cobbles and occasional boulders	SS.SCS	Subtidal chalk	Chalk	Pebble/cobble	
54	54_S8	00:00:35	Very poor	Dense red seaweeds on rugged chalk bedrock	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
54	54_S9	00:00:33	Very poor	Gravelly sand with patchy pebbles and cobbles and occasional boulders	SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
54	54_S10	00:00:21	Very poor	Red seaweeds on silty chalk bedrock with pebble and cobble infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Chalk	Rugged	
54	54_S11	00:01:02	Very poor	Patchy/sparse red seaweeds on pebbles, cobbles and boulders with coarse sediment infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Rugged	
54	54_S12	00:02:01	Very poor	Dense red seaweeds on rugged chalk bedrock with pebble and cobble infill	IR.HIR.KFaR.FoR SS.SCS	Subtidal chalk	Chalk	Rugged	
55	55_S1	00:03:26	Very poor	Dense red and brown seaweeds on chalk bedrock with coarse sediment infill	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
55	55_S2	00:02:43	Very poor	Patchy red seaweeds on pebbles, cobbles and occasional boulders	SS.SMp.KSwSS.LsacR.CbPb SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	
55	55_S3	00:00:21	Very poor	Dense red and brown seaweeds on chalk bedrock with coarse sediment infill	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
55	55_S4	00:00:38	Very poor	Red seaweeds on pebbles and cobbles	SS.SMp.KSwSS.LsacR.CbPb SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	
56	56_S1	00:02:29	Very poor	Rippled sand with patchy pebbles and cobbles	SS.SSa SS.SCS	Subtidal sands and gravels	N/A	Absent	
57	57_S1	00:01:52	Very poor	Red seaweeds on sediment-influenced bedrock with patches of pebbles, cobbles and coarse sediment	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
57	57_S2	00:00:50	Very poor	Sparse biota on pebbles and cobbles	SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	
57	57_S3	00:00:24	Very poor	Red seaweeds on sediment-influenced chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
57	57_S4	00:02:05	Very poor	Patchy red seaweeds on pebbles, cobbles and occasional boulders with patches of chalk bedrock	SS.SMp.KSwSS.LsacR.CbPb SS.SCS	Subtidal chalk	Mixed	Mixed: pebble/cobble; rugged	
57	57_S5	00:01:17	Very poor	Red seaweeds on sediment-influenced chalk bedrock ridges with pebble and cobble infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Chalk	Rugged	
57	57_S6	00:00:30	Very poor	Red seaweeds on pebbles and cobbles	SS.SMp.KSwSS.LsacR.CbPb SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	
57	57_S7	00:01:05	Zero	[Zero video quality]					
58	58_S1	00:02:36	Very poor	Seaweeds on chalk with coarse sediment infill	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
59	59_S1	00:03:00	Poor	Red seaweeds on silty chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	Grating; Grates
59	59_S2	00:00:31	Very poor	Red seaweeds on silty chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
59	59_S3	00:00:23	Zero	[Zero video quality]					
59	59_S4	00:01:05	Very poor	Red seaweeds on silty chalk bedrock with cobble and pebble infill	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
59	59_S5	00:00:20	Zero	[Zero video quality]					
59	59_S6	00:00:29	Very poor	Sparse red seaweeds on silty bedrock and boulders	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
59	59_S7	00:01:36	Very poor	Silty pebbles, cobbles and occasional boulders overlying silt-covered chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Mixed: pebble/cobble; pavement; rugged	Grating
59	59_S8	00:01:14	Very poor	Red seaweeds on silty chalk bedrock with coarse sediment infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
59	59_S9	00:04:00	Zero	[Zero video quality]					
60	60_S1	00:00:38	Very poor	Rippled sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
60	60_S2	00:00:24	Zero	[Zero video quality]					
60	60_S3	00:00:59	Very poor	Rippled sand with sparse pebbles and cobbles	SS.SSa	Subtidal sands and gravels	N/A	Absent	
60	60_S4	00:00:38	Zero	[Zero video quality]					
60	60_S5	00:00:37	Very poor	Rippled sand with sparse pebbles and cobbles	SS.SSa	Subtidal sands and gravels	N/A	Absent	
60	60_S6	00:01:29	Zero	[Zero video quality]					
60	60_S7	00:02:09	Poor	Rippled sand with dense *Metridium dianthus* on sparse large boulders with patchy pebbles and cobbles	SS.SSa CR.HCR.XFa	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
60	60_S8	00:00:36	Zero	[Zero video quality]					
60	60_S9	00:03:45	Very poor	Rippled sand with sparse pebbles and cobbles	SS.SSa	Subtidal sands and gravels	Other	Absent	
61	61_S1	00:01:28	Poor	Red seaweeds on silty chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
61	61_S2	00:02:33	Very poor	Red seaweeds on silty flat chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pavement	
61	61_S3	00:01:18	Very poor	Red seaweeds on silty rugged chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
61	61_S4	00:00:52	Very poor	Red seaweeds on silty flat chalk bedrock with some sand infill	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pavement	
61	61_S5	00:03:13	Very poor	Red seaweeds on silty rugged chalk ridges with flat chalk pavement gullies with sand infill	IR.MIR.KR.XFoR CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	Grating
62	62_S1	00:01:04	Very poor	Red seaweeds on silty chalk bedrock with overlying pebbles and cobbles	IR.MIR.KR.XFoR CR.MCR.SfR	Subtidal chalk	Chalk	Mixed: pebble/cobble; pavement	
62	62_S2	00:05:17	Very poor	Red seaweeds on silty rugged chalk ridges with flat chalk gullies with sand and gravel infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	Grating
63	63_S1	00:01:33	Very poor	Red seaweeds on silt-covered chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
63	63_S2	00:00:20	Zero	[Zero video quality]					
63	63_S3	00:01:19	Very poor	Patchy seaweeds on silty chalk bedrock with some pebbles and cobbles	CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	
63	63_S4	00:02:38	Very poor	Patchy seaweeds on silt-covered rugged chalk bedrock	CR.MCR.SfR	Subtidal chalk	Chalk	Rugged	
63	63_S5	00:00:48	Very poor	Sparse seaweeds on silt-covered chalk bedrock, cobbles and pebbles	CR.MCR.SfR SS.SCS	Subtidal chalk	Chalk	Mixed: pebble/cobble; pavement	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
63	63_S6	00:00:24	Very poor	Patchy seaweeds on silt-covered rugged chalk bedrock with pebbles and cobbles	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
64	64_S1	00:00:57	Very poor	Silty chalk pebbles, cobbles and boulders with rippled gravelly sand infill	CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
64	64_S2	00:00:28	Zero	[Zero video quality]					
64	64_S3	00:03:05	Very poor	Pebbles, cobbles and occasional boulders on rippled sand	SS.SSa CR.HCR.XFa	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
64	64_S4	00:00:31	Poor	Rippled shelly sand	SS.SSa	Subtidal sands and gravels	N/A	Absent	
64	64_S5	00:01:41	Zero	[Zero video quality]					
65	65_S1	00:01:26	Poor	Crustose communities and red seaweeds on silty pebbles and cobbles overlying chalk bedrock	SS.SCS.CCS.PomB	Subtidal chalk	Chalk	Mixed: pebble/cobble; pavement	
65	65_S2	00:00:32	Very poor	Red seaweeds on silty chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pavement	
65	65_S3	00:00:28	Very poor	Red seaweeds on silty pebbles and cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pebble/cobble	
65	65_S4	00:00:57	Very poor	Red seaweeds on silty chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
65	65_S5	00:03:34	Poor	Crustose communities and red seaweeds on silty pebbles and cobbles with *Amphilectus fucorum*	SS.SCS.CCS.PomB	Subtidal chalk	Chalk	Pebble/cobble	Grating
66	-			Video not analysed as <20 sec seabed time					
67	67_S1	00:00:42	Zero	[Zero video quality]					
67	67_S2	00:02:43	Very poor	Dense seaweeds on chalk bedrock and boulders with sand gullies	IR.HIR.KFaR.FoR SS.SSa	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
67	67_S3	00:00:40	Zero	[Zero video quality]					
67	67_S4	00:03:29	Very poor	Dense seaweeds on chalk bedrock with pebble and cobble infill	IR.HIR.KFaR.FoR SS.SCS	Subtidal chalk	Chalk	Rugged	
68	68_S1	00:02:01	Very poor	Dense red seaweeds on pebbles, cobbles and boulders	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Chalk	Pebble/cobble	
68	68_S2	00:00:26	Zero	[Zero video quality]					
68	68_S3	00:00:26	Very poor	Red seaweeds on pebbles and cobbles	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Chalk	Pebble/cobble	
68	68_S4	00:00:20	Very poor	Dense red seaweeds on rugged chalk bedrock with pebbles and cobbles	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
68	68_S5	00:02:11	Very poor	Patchy seaweeds on pebbles and cobbles	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Chalk	Pebble/cobble	
68	68_S6	00:00:29	Zero	[Zero video quality]					
68	68_S7	00:00:41	Very poor	Patchy seaweeds on pebbles and cobbles	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Chalk	Pebble/cobble	
68	68_S8	00:00:22	Very poor	Dense red seaweeds on rugged chalk bedrock	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
68	68_S9	00:01:32	Very poor	Patchy seaweeds on pebbles and cobbles with single patch of rugged chalk bedrock	SS.SMp.KSwSS.LsacR.CbPb	Subtidal chalk	Chalk	Pebble/cobble	
69	69_S1	00:01:51	Very poor	Encrusting biota on pebbles and cobbles	SS.SCS.CCS.PomB		Other	Absent	
69	69_S2	00:00:50	Zero	[Zero video quality]					
69	69_S3	00:02:34	Very poor	Flat area of pebbles with some cobbles	SS.SCS		Other	Absent	
70	70_S1	00:02:10	Poor	Red seaweeds and crustose communities on silty chalk cobbles	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
70	70_S2	00:01:01	Zero	[Zero video quality]					
70	70_S3	00:00:59	Very poor	Red seaweeds on silty chalk bedrock and cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
70	70_S4	00:00:34	Zero	[Zero video quality]					
70	70_S5	00:03:20	Very poor	Red seaweeds on silty chalk bedrock and cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
70	70_S6	00:01:05	Very poor	Red seaweeds and crustose communities on silty chalk pebbles and cobbles	SS.SCS.CCS.PomB	Subtidal chalk	Chalk	Pebble/cobble	
70	70_S7	00:04:28	Very poor	Red seaweeds on silty chalk bedrock and cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
70	70_S8	00:01:22	Very poor	Pebbles and cobbles overlying flat chalk bedrock	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Pavement	
70	70_S9	00:02:46	Very poor	Red seaweeds on silty chalk bedrock and cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
71	71_S1	00:01:11	Very poor	Foliose red and brown seaweeds on bedrock	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
71	71_S2	00:01:09	Poor	Red seaweeds & encrusting biota on silty cobbles & boulders with patchy exposed flat chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Mixed	Pavement	
71	71_S3	00:00:53	Very poor	Foliose red and brown seaweeds on bedrock	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
71	71_S4	00:01:38	Very poor	Sense red seaweeds on silty cobbles and boulders with coarse sediment infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
71	71_S5	00:02:31	Very poor	Dense foliose red and brown seaweeds on bedrock with pebbles and cobbles	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
71	71_S6	00:01:03	Poor	Red seaweeds and crustose communities on silty cobbles and boulders	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
71	71_S7	00:00:42	Poor	Red and brown seaweeds on a mixture of cobbles, boulders and exposed chalk pavement	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pavement	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
71	71_S8	00:05:31	Poor	Red seaweeds on pebbles, cobbles and occasional boulders	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	
71	71_S9	00:01:51	Very poor	Dense foliose red and brown seaweeds on bedrock with pebbles and cobbles	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	Level shear; Cuts; Grates
71	71_S10	00:03:17	Very poor	Red seaweeds and patchy encrusting biota on cobbles and pebbles	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	
71	71_S11	00:01:38	Zero	[Zero video quality]					
71	71_S12	00:02:57	Very poor	Dense foliose red and brown seaweeds on bedrock with pebbles and cobbles	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	Cut; Grates
72	72_S1	00:02:49	Poor	*Flustra foliacea* and sponges on cobbles and boulders overlying pebbles and cobbles with sparse biota	SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Other	Pebble/cobble	
72	72_S2	00:01:23	Poor	Crustose communities on pebbles, cobbles and boulders overlying flat chalk bedrock	SS.SCS.CCS.PomB CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
72	72_S3	00:01:06	Good	Flat chalk bedrock with veneer of coarse sediment, pebbles and cobbles with encrusting fauna	CR.MCR.SfR SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Mixed	Pavement	
72	72_S4	00:01:06	Poor	*Flustra foliacea* and sponges on cobbles and boulders overlying pebbles and cobbles with sparse biota	SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Other	Pebble/cobble	Angular rubble
72	72_S5	00:00:38	Poor	Red seaweeds and encrusting fauna on silty chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Pavement	Grating; Rubble
73	73_S1	00:01:30	Poor	Red seaweeds on flat chalk bedrock with sediment veneer	IR.MIR.KR.XFoR CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
73	73_S2	00:00:20	Poor	Pebbles and cobbles overlying coarse sediment with sparse red seaweeds	SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
73	73_S3	00:01:05	Poor	Red seaweeds on flat chalk bedrock with sediment veneer	IR.MIR.KR.XFoR CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	Grating; Cut
73	73_S4	00:01:41	Poor	Pebbles and cobbles overlying coarse sediment with sparse biota	SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
73	73_S5	00:02:10	Very poor	Pebbles and cobbles overlying flat chalk bedrock with sediment veneer	CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	
73	73_S6	00:02:15	Poor	Red seaweeds on flat chalk bedrock with sediment veneer	IR.MIR.KR.XFoR CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	Cut
73	73_S7	00:05:44	Poor	Pebbles and cobbles overlying coarse sediment with encrusting biota	SS.SCS.CCS.PomB	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
74	74_S1	00:01:49	Very poor	Sparse seaweeds on pebbles and cobbles with patchy exposed chalk bedrock	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Mixed: pebble/cobble; pavement	
74	74_S2	00:01:04	Very poor	Red seaweeds on silt-covered chalk bedrock	CR.MCR.SfR	Subtidal chalk	Chalk	Rugged	
74	74_S3	00:00:20	Very poor	Sparse biota on pebbles and cobbles with patchy exposed chalk bedrock	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Mixed: pebble/cobble; pavement	
74	74_S4	00:00:58	Zero	[Zero video quality]					
74	74_S5	00:06:05	Very poor	Sparse seaweeds on pebbles and cobbles with patchy exposed chalk bedrock	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Mixed: pebble/cobble; pavement	
74	74_S6	00:04:04	Very poor	Red seaweeds on slightly silty chalk bedrock with pebbles and cobbles	IR.HIR.KFaR.FoR CR.MCR.SfR	Subtidal chalk	Chalk	Rugged	Cuts
75	75_S1	00:01:01	Very poor	Patchy red seaweeds on cobbles and boulders overlying gravel and pebbles	SS.SCS IR.MIR.KR.XFoR	Subtidal chalk Subtidal sands and gravels	Mixed	Rugged	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
75	75_S2	00:09:41	Very poor	Red seaweeds on silty chalk bedrock and boulders with some coarse sediment infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	Rubble
75	75_S3	00:00:38	Zero	[Zero video quality]					
75	75_S4	00:02:34	Very poor	Red and brown seaweeds on rugged chalk bedrock with coarse sediment infill	IR.HIR.KFaR.FoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
75	75_S5	00:00:30	Zero	[Zero video quality]					
75	75_S6	00:00:30	Very poor	Red seaweeds on rugged chalk bedrock with coarse sediment infill	IR.HIR.KFaR.FoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
76	76_S1	00:00:24	Poor	Patchy pebbles, cobbles and occasional boulders overlying gravelly shelly sand with sparse biota	SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
76	76_S2	00:05:21	Poor	Red seaweeds on silty chalk bedrock with patches of pebbles and cobbles and shelly sand infill	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Mixed: pebble/cobble; rugged	Grating
76	76_S3	00:00:35	Very poor	Red seaweeds on silty chalk bedrock and cobbles	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Mixed: pebble/cobble; rugged	
76	76_S4	00:01:39	Very poor	Flat chalk bedrock with veneer of coarse sediment including pebbles, cobbles and sparse boulders	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Mixed: pebble/cobble; pavement	
76	76_S5	00:03:24	Very poor	Red seaweeds on chalk ridges with gullies composed of flat chalk pavement and sand veneer	IR.HIR.KFaR.FoR CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	Grating
76	76_S6	00:00:29	Very poor	Flat chalk bedrock with sand veneer with patchy pebbles and cobbles	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
77	77_S1	00:00:20	Very poor	Seaweeds on chalk bedrock	CR.MCR.SfR	Subtidal chalk	Chalk	Rugged	
77	77_S2	00:02:09	Poor	Pebbles and cobbles overlying sediment-covered flat chalk bedrock with occasional boulders	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Mixed: pebble/cobble; pavement	
77	77_S3	00:01:08	Poor	Sparse red seaweeds and encrusting biota on pebbles and cobbles	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
78	78_S1	00:00:18	Poor	Crustose communities on pebbles and cobbles overlying coarse sediment with sparse red seaweeds	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
78	78_S2	00:01:30	Poor	Red seaweeds and crustose communities on sediment-influenced chalk bedrock	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	Abrasion; Grating
78	78_S3	00:00:39	Zero	[Zero video quality]					
78	78_S4	00:00:38	Very poor	Red seaweeds and crustose communities on sediment-influenced chalk bedrock with pebbles and cobbles	IR.HIR.KFaR.FoR SS.SCS	Subtidal chalk	Chalk	Rugged	
78	78_S5	00:01:10	Very poor	Crustose communities on pebbles and cobbles with sparse red seaweeds	SS.SCS.CCS.PomB	Subtidal chalk	Mixed	Pebble/cobble	
78	78_S6	00:00:52	Zero	[Zero video quality]					
78	78_S7	00:02:19	Poor	Crustose communities and red seaweeds on pebbles, cobbles and boulders with patchy chalk bedrock	SS.SCS CR.MCR.SfR	Subtidal chalk	Mixed	Pebble/cobble	Grating
78	78_S8	00:00:44	Zero	[Zero video quality]					
78	78_S9	00:00:35	Very poor	Sparse biota on pebbles and cobbles [uncertain]	SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
79	79_S1	00:04:48	Poor	Red seaweeds on silty pebbles, cobbles and rugged chalk with faunal turf and crustose communities	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Mixed: pebble/cobble; rugged	
79	79_S2	00:00:40	Very poor	Crustose communities and sparse red seaweeds on pebbles and cobbles	SS.SCS.CCS.PomB	Subtidal chalk	Chalk	Pebble/cobble	
79	79_S3	00:00:40	Zero	[Zero video quality]					
79	79_S4	00:01:13	Very poor	Red seaweeds on sediment-affected chalk bedrock		Subtidal chalk	Chalk	Rugged	
79	79_S5	00:00:24	Zero	[Zero video quality]					
79	79_S6	00:03:50	Very poor	Red and brown seaweeds on sediment-affected chalk bedrock with pebbles and cobbles	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Chalk	Rugged	
79	79_S7	00:00:44	Zero	[Zero video quality]					
79	79_S8	00:01:58	Very poor	Dense red seaweeds on sediment-affected chalk bedrock with pebbles and cobbles		Subtidal chalk	Chalk	Rugged	
79	79_S9	00:00:51	Zero	[Zero video quality]					
79	79_S10	00:01:54	Very poor	Red seaweeds on sediment-affected chalk bedrock		Subtidal chalk	Chalk	Rugged	
79	79_S11	00:00:44	Zero	[Zero video quality]					
79	79_S12	00:01:02	Very poor	Red seaweeds on sediment-affected chalk bedrock		Subtidal chalk	Chalk	Rugged	
79	79_S13	00:00:52	Zero	[Zero video quality]					
80	80_S1	00:20:09	Very poor	Patchy red and brown seaweeds on sediment-affected chalk bedrock, boulders and cobbles	IR.MIR.KR.XFoR SS.SCS	Subtidal chalk	Chalk	Rugged	Cut; Grating; Grates; Strikes
80	80_S2	00:00:32	Zero	[Zero video quality]					

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
80	80_S3	00:01:05	Very poor	Red seaweeds on sediment-affected chalk bedrock and boulders	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
81	81_S1	00:00:30	Very poor	Pebbles and cobbles overlying coarse sediment with red seaweeds on occasional boulders	SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
81	81_S2	00:07:37	Very poor	Red and patchy brown seaweeds on chalk bedrock and boulders with cobbles and coarse sediment infill	IR.HIR.KFaR.FoR SS.SCS	Subtidal chalk	Chalk	Rugged	
82	82_S1	00:04:08	Very poor	Red and brown seaweeds on chalk bedrock and boulders with cobbles and coarse sediment infill	IR.HIR.KFaR.FoR SS.SCS	Subtidal chalk	Chalk	Rugged	
82	82_S2	00:01:37	Very poor	Red seaweeds on pebbles and cobbles with coarse sediment infill	SS.SMp.KSwSS.LsacR.CbPb SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
82	82_S3	00:01:27	Very poor	Red and brown seaweeds on chalk bedrock	IR.HIR.KFaR.FoR	Subtidal chalk	Chalk	Rugged	
82	82_S4	00:01:04	Very poor	Red seaweeds on pebbles and cobbles with coarse sediment infill and patchy chalk bedrock	SS.SMp.KSwSS.LsacR.CbPb SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
83	83_S1	00:02:06	Very poor	Alternating patches of flat sand-covered chalk bedrock and pebbles and cobbles with sparse biota	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
83	83_S2	00:01:42	Very poor	Sand-covered flat chalk bedrock with pebbles, cobbles and occasional boulders	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
83	83_S3	00:01:58	Zero	[Zero video quality]					
83	83_S4	00:05:55	Very poor	Sand-covered flat chalk bedrock with pebbles, cobbles and occasional boulders	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	Cut

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
83	83_S5	00:12:40	Very poor	Rugged chalk bedrock ridges with flat sand-covered chalk gullies and patches of pebbles and cobbles	CR.MCR.SfR	Subtidal chalk	Chalk	Rugged	Abrasion; Burn; Cut; Grating; Strike
83	83_S6	00:01:27	Very poor	Sand-covered flat chalk bedrock with pebbles and cobbles	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Pavement	
83	83_S7	00:05:05	Very poor	Rugged chalk bedrock ridges with flat sand-covered chalk gullies and patches of pebbles and cobbles	CR.MCR.SfR	Subtidal chalk	Chalk	Rugged	Cut; Grating; Cuts; Strikes
84	84_S1	00:03:59	Very poor	Red seaweeds on sediment-affected cobbles and boulders on gravelly sand with patchy chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
84	84_S2	00:00:43	Very poor	Red seaweeds on silty chalk bedrock	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	Abrasion; Cuts
84	84_S3	00:01:12	Very poor	Encrusting biota on pebbles, cobbles and boulders with coarse sediment infill	SS.SCS	Subtidal chalk	Mixed	Pebble/cobble	
84	84_S4	00:00:30	Very poor	Red seaweeds on sediment-affected hard substrate	IR.MIR.KR.XFoR	Subtidal chalk	Chalk	Rugged	
84	84_S5	00:03:59	Very poor	Pebbles and cobbles on shelly gravelly sand with patchy red seaweeds and encrusting fauna	SS.SCS	Subtidal chalk Subtidal sands and gravels	Mixed	Pebble/cobble	
84	84_S6	00:00:42	Zero	[Zero video quality]					
85	85_S1	00:00:32	Very poor	Pebbles overlying flat chalk bedrock with seaweeds		Subtidal chalk	Chalk	Pavement	
85	85_S2	00:00:47	Zero	[Zero video quality]					
85	85_S3	00:04:50	Very poor	Patchy rugged chalk bedrock & boulders with pebbles & cobbles & areas of flat chalk with sand veneer	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	

Dive ID	Segment no.	Segment duration	Quality	Habitat description	Biotope(s) assigned	Habitat FOCI(s) identified	Dominant rock type	Chalk category	Chalk impact categories recorded
86	86_S1	00:00:38	Zero	[Zero video quality]					
86	86_S2	00:01:54	Very poor	Patchy red seaweeds on boulders with pebbles and cobbles	CR.MCR.SfR SS.SCS	Subtidal chalk Subtidal sands and gravels	Chalk	Rugged	
86	86_S3	00:00:54	Very poor	Pebbles and cobbles with patchy red seaweeds on occasional boulders	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Chalk	Pebble/cobble	
86	86_S4	00:00:50	Zero	[Zero video quality]					
87	87_S1	00:03:08	Very poor	Patchy red seaweeds and sponges on pebbles and cobbles with some patches of flat chalk bedrock	SS.SCS CR.MCR.SfR	Subtidal chalk Subtidal sands and gravels	Mixed	Pavement	
87	87_S2	00:01:08	Very poor	Flat chalk bedrock with veneer of sand and gravel	CR.MCR.SfR	Subtidal chalk	Chalk	Pavement	
87	87_S3	00:01:15	Very poor	Sparse red seaweeds and encrusting fauna on pebbles and cobbles overlying sand	SS.SCS	Subtidal chalk Subtidal sands and gravels	Other	Pebble/cobble	
88	88_S1	00:04:22	Very poor	Rippled slightly shelly sand with sparse cobbles	SS.SSa	Subtidal sands and gravels	N/A	Absent	